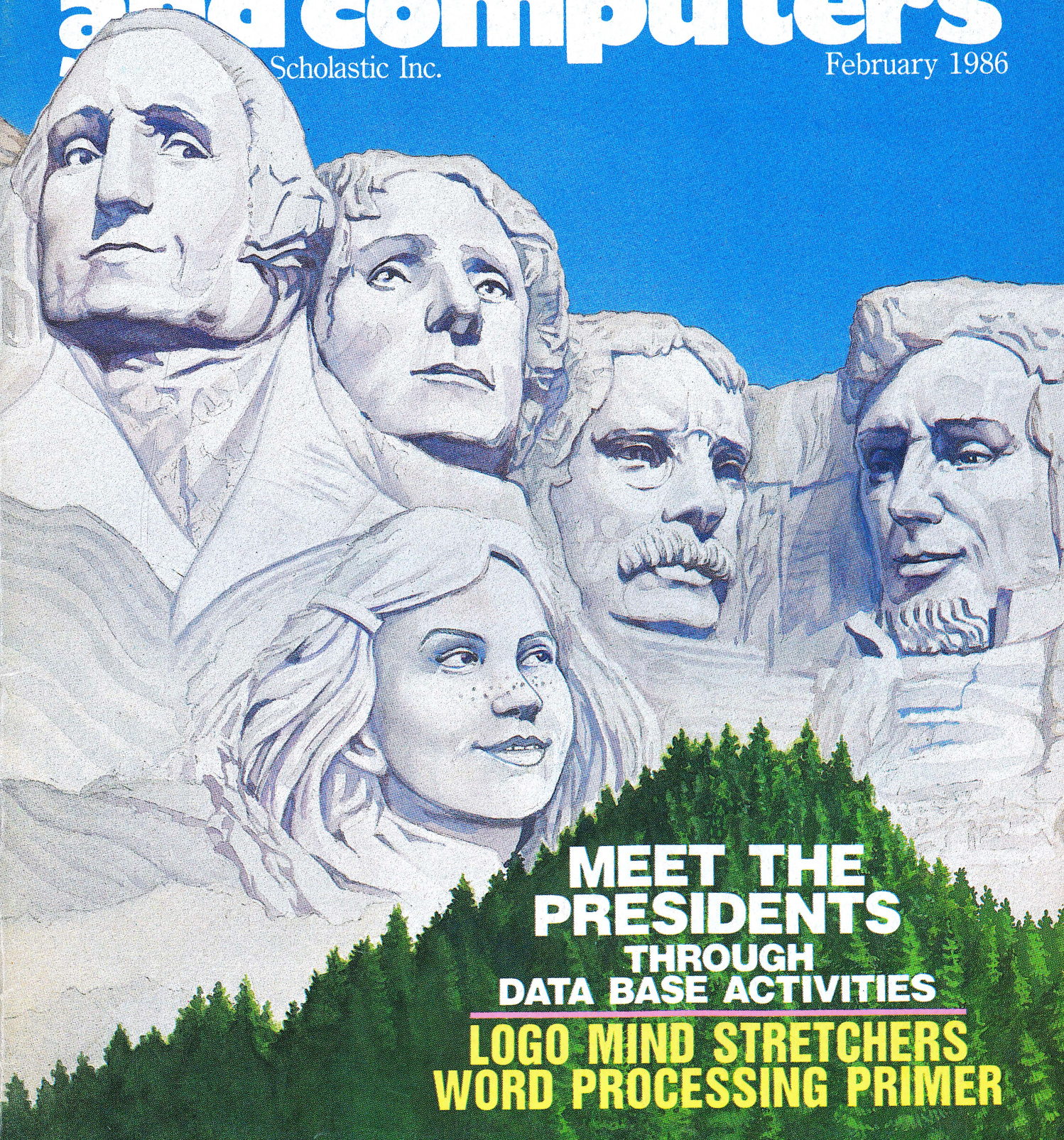
Volume 3, Number 5 $3.50

Scholastic's Magazine for Today's Elementary Classrooms

TEACHING and computers®

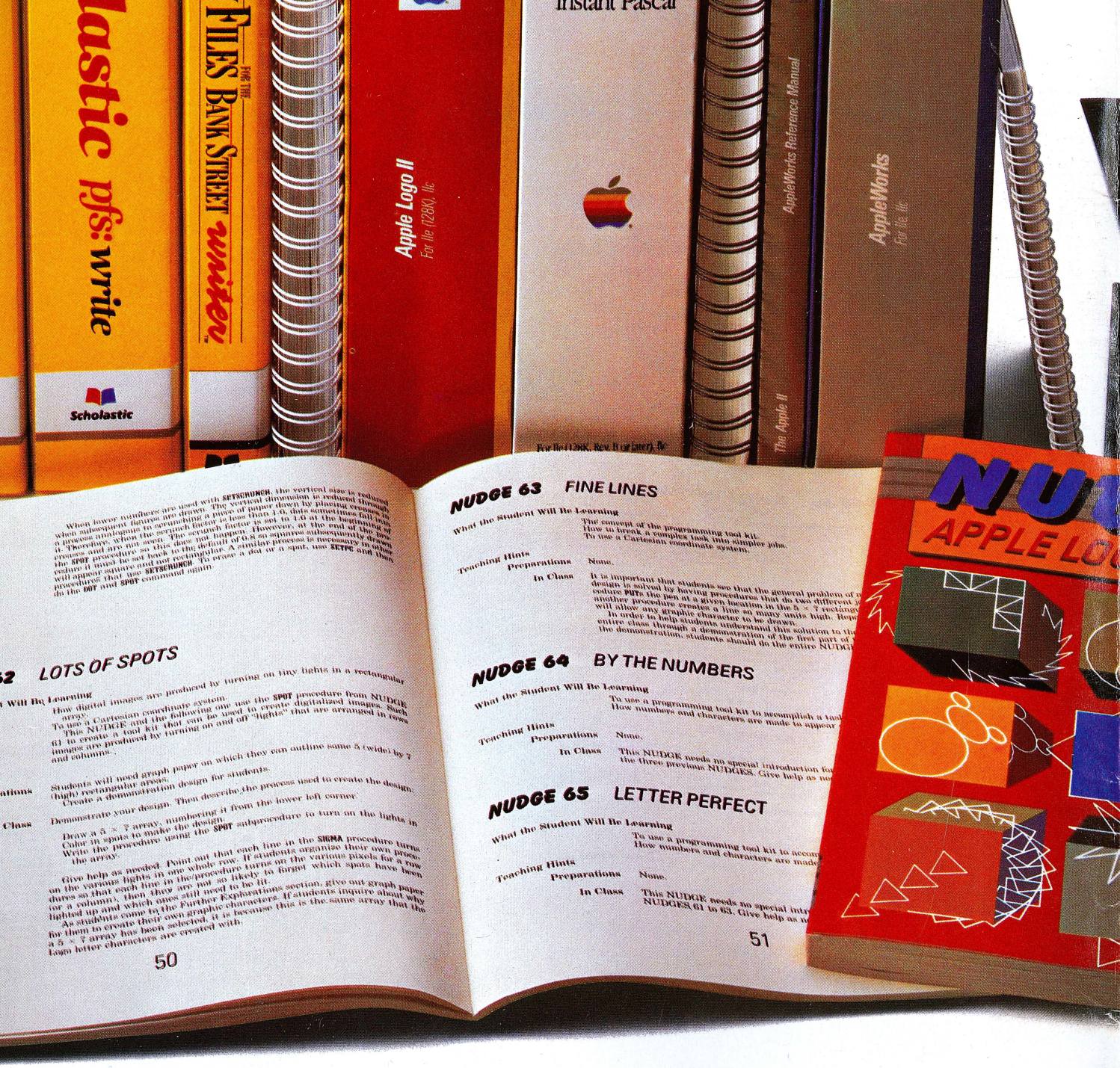
Scholastic Inc. February 1986



MEET THE PRESIDENTS THROUGH DATA BASE ACTIVITIES

LOGO MIND STRETCHERS

WORD PROCESSING PRIMER



A teacher for the Apple.

You've made it through lost homework assignments, budget cuts, measle epidemics and jammed ditto machines.

Now you've come face-to-face with a computer in the classroom.

Before you start moving slowly towards the nearest exit, check to see if the computer has an Apple® logo on it.

If so, you're in luck.

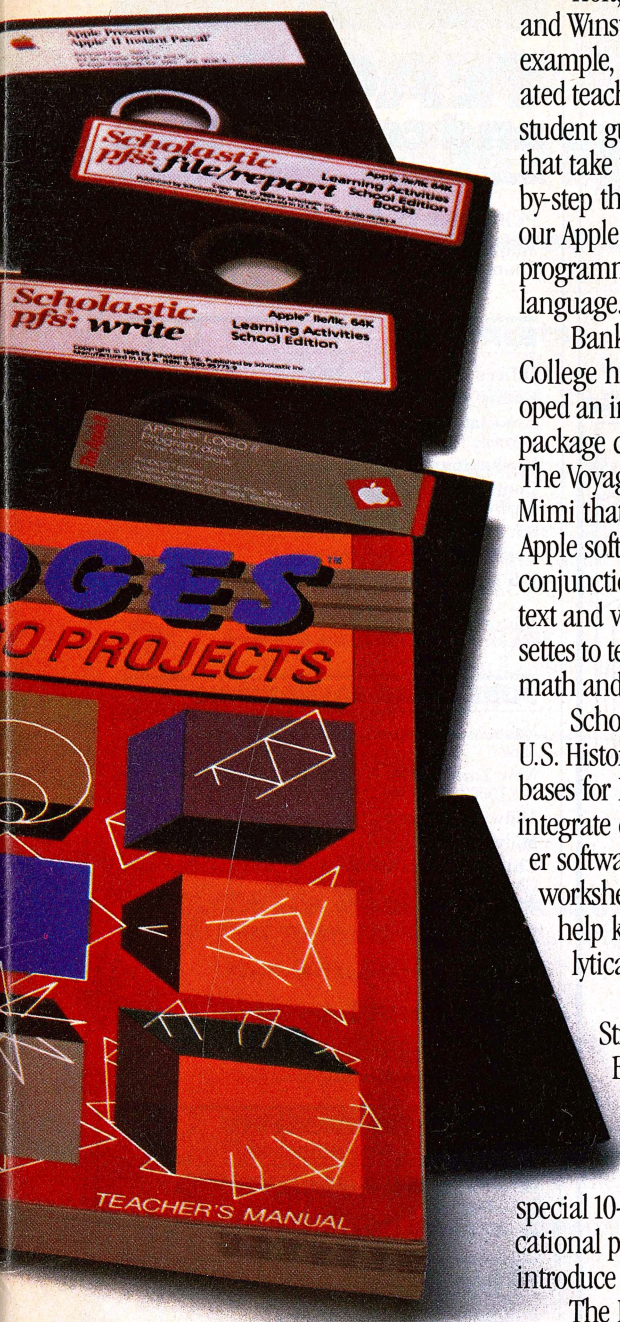
Because Apple computers not only make it easier for students to learn, they also make it easier for teachers to teach.

Thanks to something we call courseware — computer software that comes complete with supplemental textbooks, lesson plans, worksheets and student guides.

And, most importantly, the documentation and reference material you need to painlessly integrate Apple computers into your curriculum.

Without taking a crash course in computer science.

Since Apple computers are used in schools more than all other personal computers combined, leading publishers have been working with us for years



Holt, Rinehart and Winston, for example, has created teacher and student guides that take you step-by-step through our Apple Logo II programming language.

Bank Street College has developed an innovative package called The Voyage of the Mimi that uses Apple software in conjunction with text and videocassettes to teach kids math and science.

Scholastic's U.S. History Databases for PFS:File integrate computer software with worksheets and lesson plan ideas to help kids learn research and analytical skills in social studies.

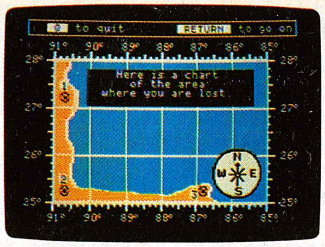
And programs like Bank Street StoryBook by George Brackett and Reader Rabbit can help kids improve their reading and writing skills.

We've also developed special 10-pack bundles of different educational programs that are designed to introduce students to computer learning.

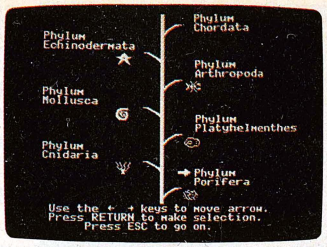
The Elementary Classroom Software Solution* bundle includes programs that teach kids basic writing and language skills, keyboarding and a powerful programming language.

And for secondary schools, we've bundled together the Secondary Classroom Software Solution, including word processing, database, keyboarding and computer language software.

In short, no matter what it is you want to teach, an Apple computer can help you teach it.

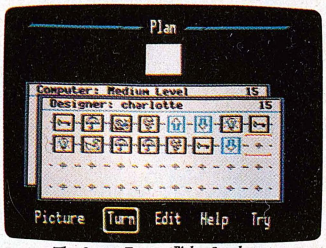


The Voyage of the Mimi™ from Holt, Rinehart and Winston. Ecology, science and basic navigation.



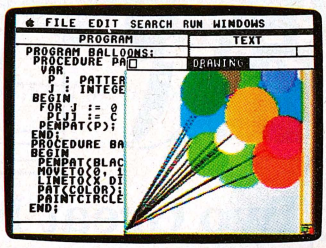
Planetary Construction Set: Discoveries in Science™ by Sunburst Communications, Inc. Science simulation.

Where in the World is Carmen Sandiego?™ by Broderbund Software, Inc. Social studies.



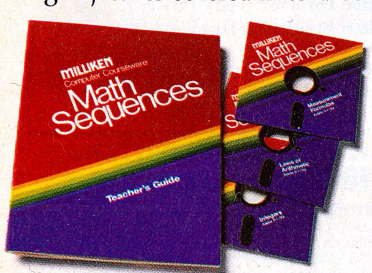
The Super Factory™ by Sunburst Communications, Inc. Problem solving in three dimensions.

Reader Rabbit® by The Learning Company. Early reading and vocabulary skills.



Instant Pascal® by Think Technologies, Inc. Computer programming.

to find better ways of making software programs work in conjunction with learning objectives covered in textbooks.



Programs like Milliken's Math Sequences take kids through multiple grade levels.

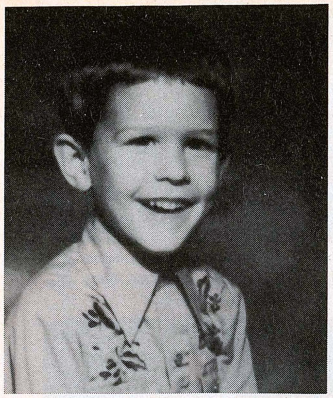
Better than you've ever been able to teach it before.

Because most kids are not only attracted to learning on an Apple computer, they actually think it's a heck of a lot of fun.

Which means they just might start showing up at school every morning with a nice surprise for you.

A little more enthusiasm.

The elementary bundle includes Apple Logo II; Bank Street Writer II, Activity Files I and II; and Microtype: The Wonderful World of PAWS. The secondary bundle includes Alphabetic Keyboarding, Apple II Instant Pascal and your choice of AppleWorks™ or Scholastic's PFS: Write and File. *© 1985 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Instant Pascal is a registered trademark of Think Technologies, Inc. Bank Street StoryBook is published by Mindscape, Inc. Bank Street Writer is a trademark of Bank Street College/ Broderbund Inc.* *For an authorized Apple dealer near you, call* ***(800) 538-9696.*** *In Canada, call* ***(800) 268-7796*** *or* ***(800) 268-7637.***



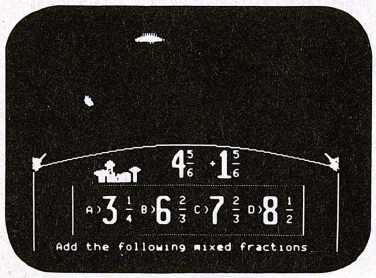
HAVE YOU SEEN THIS CHILD?

Gregory Winford Zimmerman
Born: December 14,1979
Missing From: Rio Linda, CA
Missing Since: March 24, 1985
Eyes: Hazel
Hair: Brown

If you have information on the whereabouts of Gregory (case #3418), or if you suspect another child of being a victim of aduction, please contact CHILD FIND, INC. P.O. Box 277, New Paltz, NY 12561; 800/426-5678. All information will be handled in strict confidence.

Two Great New Ideas From Opportunities For Learning!

The Wizard has arrived, and he's brought five exciting math programs for your classroom! Each features sharp-looking graphics, sound effects, and record keeping for 250 students, and are available for Apple and Commodore 64. Titles include:



Starship Alert

- Think Tank 1
- Think Tank 2
- Starship Alert
- Fraction Tutorial
- Space Equations

And that's not all! We're also introducing *The Computer Approach to English,* a brand-new catalog of the best in software for writing, reading, spelling, and language arts. See for yourself why thousands of teachers keep coming back to us—write today for your free catalogs!

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TEACHING and computers®

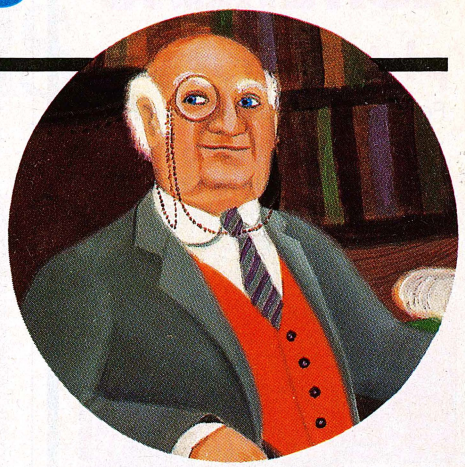
Published by Scholastic Inc.
February 1986 Vol.3, Issue 5

FEATURES:

12 Meet the Presidents
Celebrate Presidents' Day with a this super history unit. It shows students how to make and use a computerized data file on the 40 U.S. presidents.

18 Secrets to Teaching Word Processing
Psssssst. The secret to teaching word processing is that there are *no* big secrets — just five basic skills that students need to practice over and over. The wacky language arts activities in this unit will give kids that practice, and some fun, at the same time!

37 Thinking with Logo
Four task cards that use Logo to help children develop deductive and inductive thinking skills.



18 Word processing with Morris.

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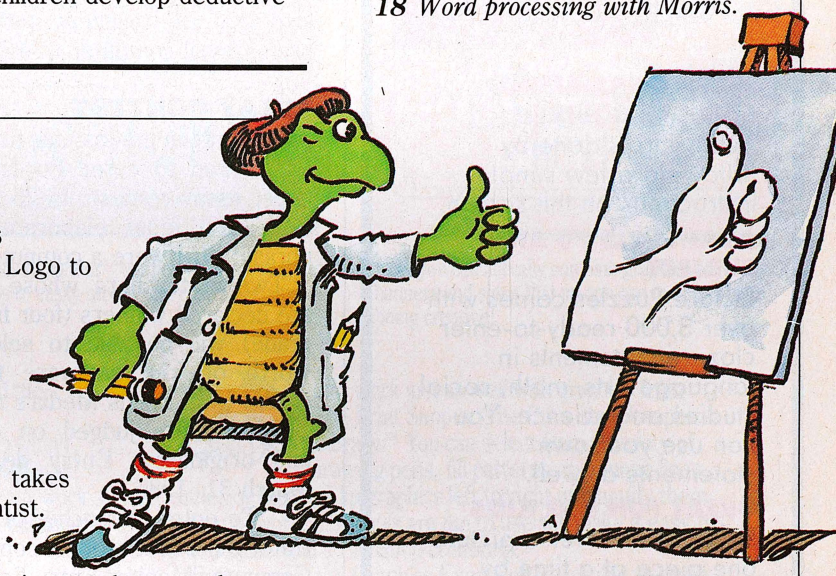
"Logo Polygons"

25 *T&C*'s Poster Worksheets
Four reproducible worksheets on using Logo to make polygons.

29 "Micro Times"
A four-page mini-magazine for kids who love computers.

42 Program of the Month
This month's program, *Dental Checkup,* takes students on a simulated visit to the dentist.

46 BASIC Challenge Cards
Two task cards for beginning program writers and two cards on using subroutines in BASIC.



37 The art of thinking.

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BRYCE LEE

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FROM

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picture puzzles

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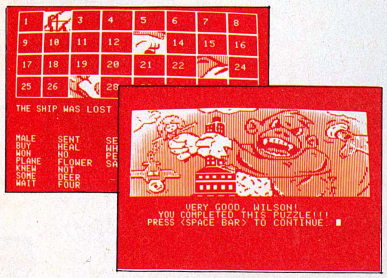

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UPDATE

NEWS FOR COMPUTER-USING TEACHERS

CALL FOR NATIONWIDE DEMONSTRATION SCHOOLS

Each of our 50 states should have at least one demonstration school that shows teachers the educational uses of new technologies. That is the recommendation of The National Task Force on Educational Technology, headed by former U.S. Secretary of Education Terrel H. Bell.

Each demonstration center, the task force suggests, should be supported by its participating district, local industries that could provide equipment and expertise, and the state, which would pay salaries for the center's staff.

The education and industry leaders of the 26-member task force emphasize that *all* teachers should have professional computer training.

ESSAY CONTEST

Students in grades four through six are invited to enter Focus Media's latest essay contest. In 75 words or less they must elaborate on the phrase: "If I were a computer.. . ."

Twelve teachers whose students are declared winners (four from each grade) will be able to select $500 worth of free software for their school from Focus Media's catalogs.

Entries are judged on creativity and originality. Entry deadline is March 31, 1986.

To enter, a teacher or administrator must first request copies of the Computer Monitor Entry Form. Contact: Department JR, Focus Media, Inc., P.O. Box 865, 839 Stewart Ave., Garden City, NY 11530.

SOFTWARE CATALOG FOR EXCEPTIONAL CHILDREN

A catalog of software programs for children with special learning needs is available free to educators from CEO (Creating Effective Organizations) Associates. The catalog describes software published by a variety of companies on these topics: reading, language development, language arts, math, problem solving, preacademics, and living skills. Each program description includes instructional objectives and special features of the software. Some of the software is specially designed for exceptional children; other software is designed for general use, but has special ed. applications.

For your free copy of *Exceptional Software for Exceptional Children,* contact: CEO Associates, Inc., 201 Route 516, Old Bridge, NJ 08857.

RATINGS ON EARLY ED. SOFTWARE

More than 100 software programs for children in preschool and kindergarten are rated in *The Survey of Early Childhood Software,* published by the High/Scope Educational Foundation. For a copy, send $19 to: High/Scope, 600 N. River St., Ypsilanti, MI 48197.

COMPUTERS INCREASE IN SOVIET SCHOOLS

Computer classes are now part of the curriculum in all Soviet secondary schools, according to a recent article in the *Christian Science Monitor.* Computers are also being phased into Soviet *Kombinats* (teaching and job training complexes, similar to American vocational schools).

Most of the keyboards on computers used by Soviet children have both English and Russian letter keys on them. That's because in many cases children must use programs that are driven by English commands. Typing in English, however, tends to slow Soviet children down somewhat.

Even so, Soviet children find computers entering into their lives more and more all the time. "Perhaps one day," predicted one 15-year old girl enrolled in the program, "there will even be computers that can be used in the home."

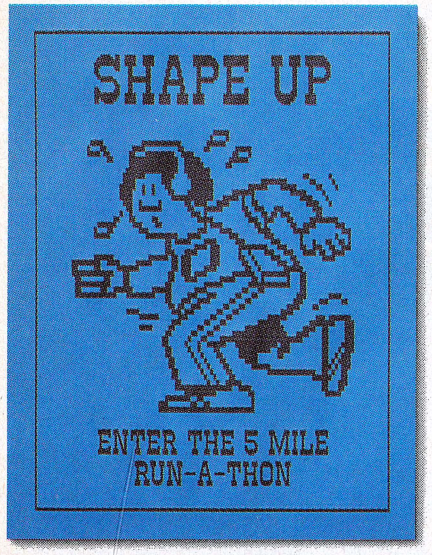
FUND-RAISING BOOKLET

A 24-page booklet, titled *35 Ways to Take a "Byte" out of Software Costs,* is available free from COMPress, a publisher of educational software. The booklet reports on ways schools across the country have raised funds for software purchases.

To receive a copy of the booklet, write to COMPress, P.O. Box 102, Wentworth, NH 03282. ■

Circle 13 on Reader Service Card.

BET YOU NEVER PICTURED THE PRINT SHOP™ DOING THIS.



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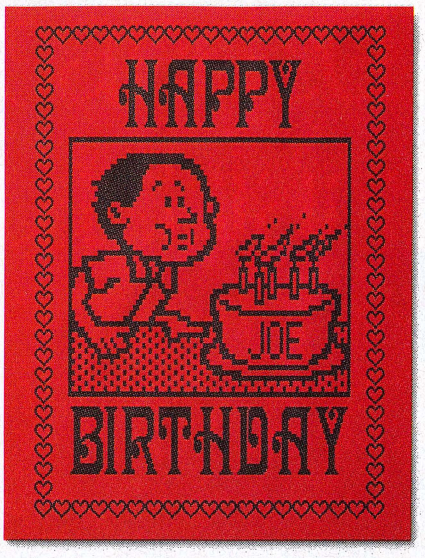

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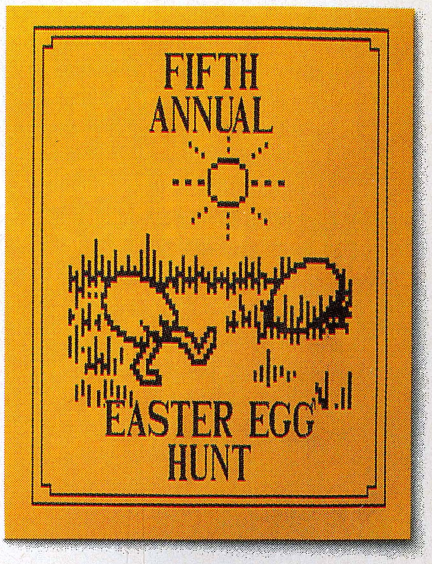

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It's easy because the Graphics Expander provides powerful drawing and editing tools

that work just as well with graphics from The Print Shop or The Print Shop Graphics Library.™ You can select from a variety of drawing pens, fill patterns, automatic lines, circles or boxes. Flip graphics left to right or magnify them for detail work. The tools are fun to use and make it easy to personalize your Print Shop creations.

Futhermore, the Graphics Expander allows you to make Print Shop graphics out of your favorite computer pictures from any source such as a Koala Pad™ or digitizer. Any portion of a standard high resolution picture can now be part of your banners, signs and greeting cards.

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Available for the Apple II+, IIe, IIc. IBM and Commodore versions are coming soon.
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ASK THE EXPERTS

ANSWERS TO YOUR COMPUTER QUESTIONS

Every month in this column, experienced computer teachers and technical consultants from across the country offer advice about hardware, software, classroom management, philosophy, and other issues associated with educational computing. If you have a question, write to "Ask the Experts," *Teaching and Computers*, 730 Broadway, New York, NY 10003.

WHICH PRINTER WORKS WITH MY COMPUTER?

Q ***We finally have enough funds to purchase a printer for our school's computer. How do I know which printers are compatible with our computer model?***

Jodi Heimler
Philadelphia, PA

A Most printers attach to computers through one of two interfaces— serial or parallel. Check to see if your computer has a serial or a parallel printer port. (Your users' manual will tell you.) If it has a parallel printer port, you need a parallel printer and a parallel printer cable that fits your computer's port. It's that simple.

If your computer has a serial printer port, you have more to worry about. Serial cables for classroom computers come in a variety of shapes and sizes. First, find out whether your computer's port is standard or nonstandard. (Once again, check your users' manual.) If it's standard, you probably won't have difficulty finding a printer and connector that work with it.

If it's nonstandard, as with Commodore computers, you can buy a printer that's specially designed to work with your computer brand (usually available from the company that made the computer). Or, you can buy an adapter that converts your computer's nonstandard printer interface into a standard one.

Adapters are also available that convert a nonstandard serial interface, such as the Commodore's or the Apple IIc's, into a parallel one that works with just about any parallel printer. The advantage of using a parallel interface is that you get increased speed since information is sent to the printer through eight separate parallel wires simultaneously; serial printers send data one bit at a time.

As you can see, shopping for a printer can be complicated. Some printer manufacturers are making it easier by selling plug-in "personality" packs that make their printer compatible with most classroom computers.

DISAPPEARING DATA

Q ***Sometimes a program or data file "disappears" from one of our classroom disks. What causes this?***

Gary Kinder
Albuquerque, NM

A When a file disappears from a disk, the first question to ask is whether someone erased it, either deliberately or accidentally.

The next thing to consider is maltreatment of the disk. Although floppy disks are relatively sturdy, leaving one on a radiator or a sunny windowsill can damage it. Also, dust or fingerprints on the exposed surfaces of the disk can make data impossible to read. And, other physical abuse, such as bending, puncturing, or water immersion, will ruin a disk. Make sure your students know how to care for a disk properly and which parts should not be touched.

According to technical consultant Lance Paavola, the most common kind of data loss results from invisible magnetic fields that electrical equipment, such as computer components, radiate. For example, leaving a disk near a printer or monitor can damage it. Similarly, one ring from a telephone can zap a disk that's leaning against it. Hence, be sure to store disks in a protected box that is not too close to electronic components.

How close is *too* close? That depends on the strength of the magnetic field involved. In most cases, storing disks about six inches from computerized components should be a safe distance.

For double insurance, make backup copies of your disks. Also, consider buying high quality disks; ones that require a stronger magnetic field to erase contents.

As for your lost data, a "disk doctor" utility program may help you get it back. Available for most computers, disk doctor programs often can retrieve even deliberately erased files as long as no other data has been stored over them.

WORD PROCESSING FOR TOTS

Q ***Is there a word processing program that prints out large letters for the primary grades?***

Craig Dickinson
Orono, ME

A If you have an Apple computer, you're in luck. For primary grades, our experts recommend a word processing program called *Magic Slate*. *Magic Slate* is actually three word processors in one. It contains a 20-column version (that means 20 characters per line) with oversized type that is perfect for primary and visually impaired students, a 40-column version with smaller type and six type styles, and an 80-column version with even smaller type, a variety of type styles, and advanced word processing features such as split screen viewing. The 20-column version allows you to underline text, an ability rarely found in simple word processing packages that are designed for kids.

Ann Dana, microcomputer consultant for District 181 in Hinsdale, Illinois, says, "*Magic Slate* is the best word processor I've taught with."

SOFTWARE RECOMMENDED IN THIS COLUMN

Following is information for the programs mentioned by the educators in this column.

Magic Slate
Computers: Apple II series
Price: $89.95
Source: Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; 914/769-5030. ■

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Introd

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Easy to learn, Easy to teach.

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Or, sophisticated simplicity.

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Because working with it is easier than talking about it.

Which is one reason you're going to love LogoWriter.

As every educator knows, learning by doing is the best learning there is.

And LogoWriter has been designed to make that learning easy. For you. And your students.

With a Teacher's Guide, Project Books and Activity Sheets.

All-in-One Word Processing, Graphics & Programmability.

LogoWriter puts word processing, graphics and

It's easier do

ucing Writer.™

programmability together in an innovative, more accessible way.

How?

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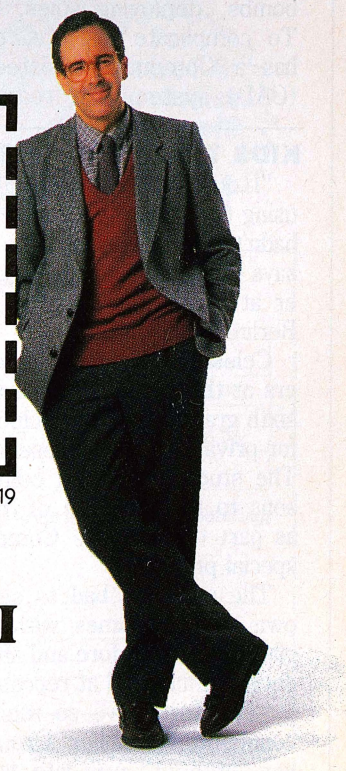

ne than said.

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CLASSROOM HAPPENINGS

BY LESLI ROTENBERG

SWISS AND U.S. STUDENTS BUILD BRIDGE OF PEACE

Two weeks before the Reagan-Gorbachev summit in Geneva, Switzerland, students in Boston, Massachusetts, and Geneva negotiated their own kind of peace treaty on computers 3,000 miles apart.

The students in Boston, ranging in age from nine to 16, and English-speaking students of the same age from Geneva, learned the delicacies of peace negotiations by playing a computer game called *The Other Side* (published by Tom Snyder Productions).

In the game, two teams, each representing different countries, try to build a bridge over the strait that divides them. The goal is to build the bridge in as few years (each turn represents one year) as possible. Teams accumulate cash to pay for the bridge by drilling for fuel and trading with each other. If a team chooses to play competitively, that is, if it tries to be the team to lay the last brick, it must manipulate the actions of the other side accordingly. This can be done in a number of ways; these ways include building bombs, deploying spies, and lying. To complicate matters, each team has a Computer Assisted Defense (CAD) system that reacts to perceived threats to its country's security by sending patrols into the other side's territory or by dropping bombs.

Boston students use computers to negotiate peace with Swiss students.

The teams' computers were linked by phone modems. Students communicated by typing short messages into the game's "hotline." As the two sides struggled to cooperate, misunderstandings inevitably arose. The U.S. team questioned the intentions of the Swiss team.

"They said they wanted to collaborate and now they've bombed us," a 13-year-old American, Daniel Wagner, grumbled at one particularly tense moment. "Let's attack them."

But peace prevailed. After less than two hours of negotiating, the students succeeded in building a bridge of peace between the two countries. As members of the U.S. and Swiss press approached students on both sides of the Atlantic for interviews, cheers and applause erupted in the two camps.

KIDS TEACH TEACHERS

"I don't think I would have tried using the computer this year if Jenny hadn't asked me to take lessons," says Celeste Tiller, first grade teacher at Worcester Country School in Berlin, Maryland.

Celeste was one of several teachers at the school recruited by seven sixth grade students (including Jenny) for private word processing lessons. The students offered computer lessons to the teachers of their choice as part of an Apple Computer Club special project.

The students had to set up their own teaching times with their "pupils," such as before and after school, during lunch, and at recess.

"Teachers have so much to do," commented Jennifer Cropper when her "student" was late for a class. "That's why they haven't had time to learn about computers."

The teachers learned how to handle floppy disks, the computer, and the printer; how to write and edit on a word processor; and how to get a printout of their work. The students were surprised that the teachers, like themselves, often had trouble deciding what to write about. And, like the kids, their favorite part of every lesson was seeing their words come out on the printer at the end!

Two of the sixth graders devised an examination to determine if the teachers had learned enough to go on or if they had to repeat the course. Despite lots of jokes about going to summer school if they failed, all passed with flying colors.

Merle Marsh, computer club advisor and academic dean of the school, says that everyone profited from the experience. It gave students a chance to polish their word processing skills and made them feel important because they were contributing a valuable service, she says. At the same time, it allowed teachers to work with computers in a convenient and nonthreatening environment.

The project even stimulated the curiosity of teachers who didn't take the lessons. The school's English teachers, in particular, requested instruction from the students. All the teachers involved in the project are determined to continue with their computer studies — even though their tutors are moving on to seventh grade. ■

Lesli Rotenberg is associate editor for *Teaching and Computers*.

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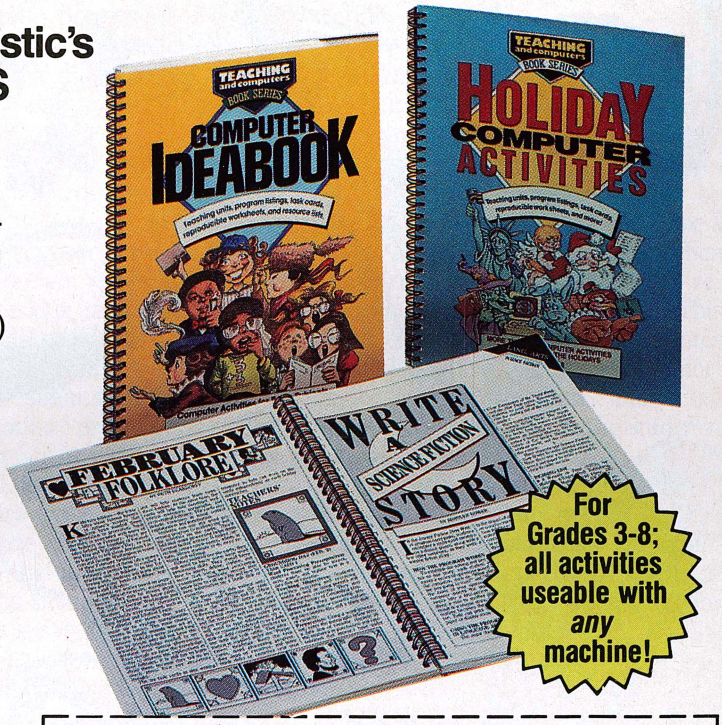

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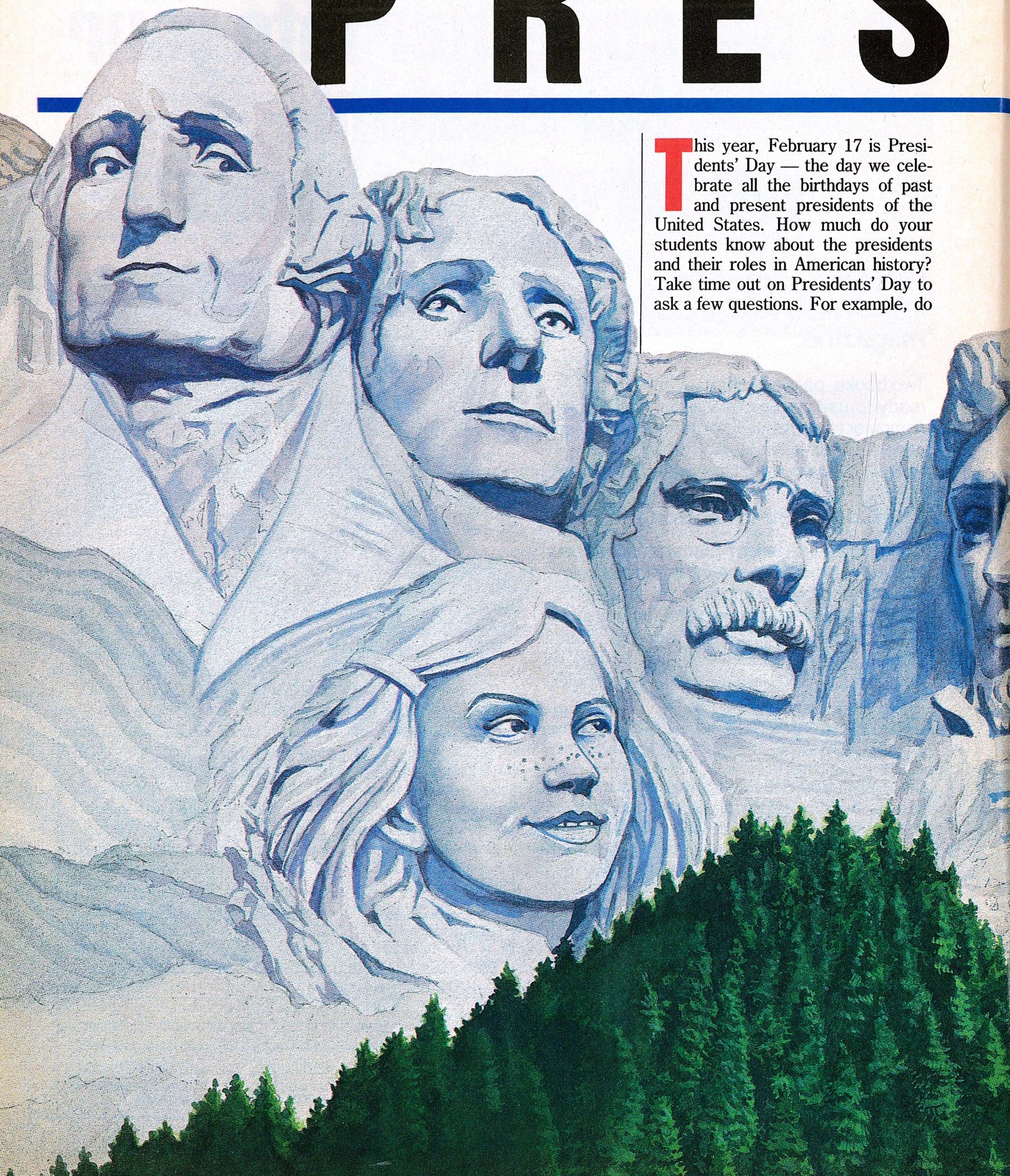
MEET THE PRES

By Beverly Hunter and Dr. Mary Furlong

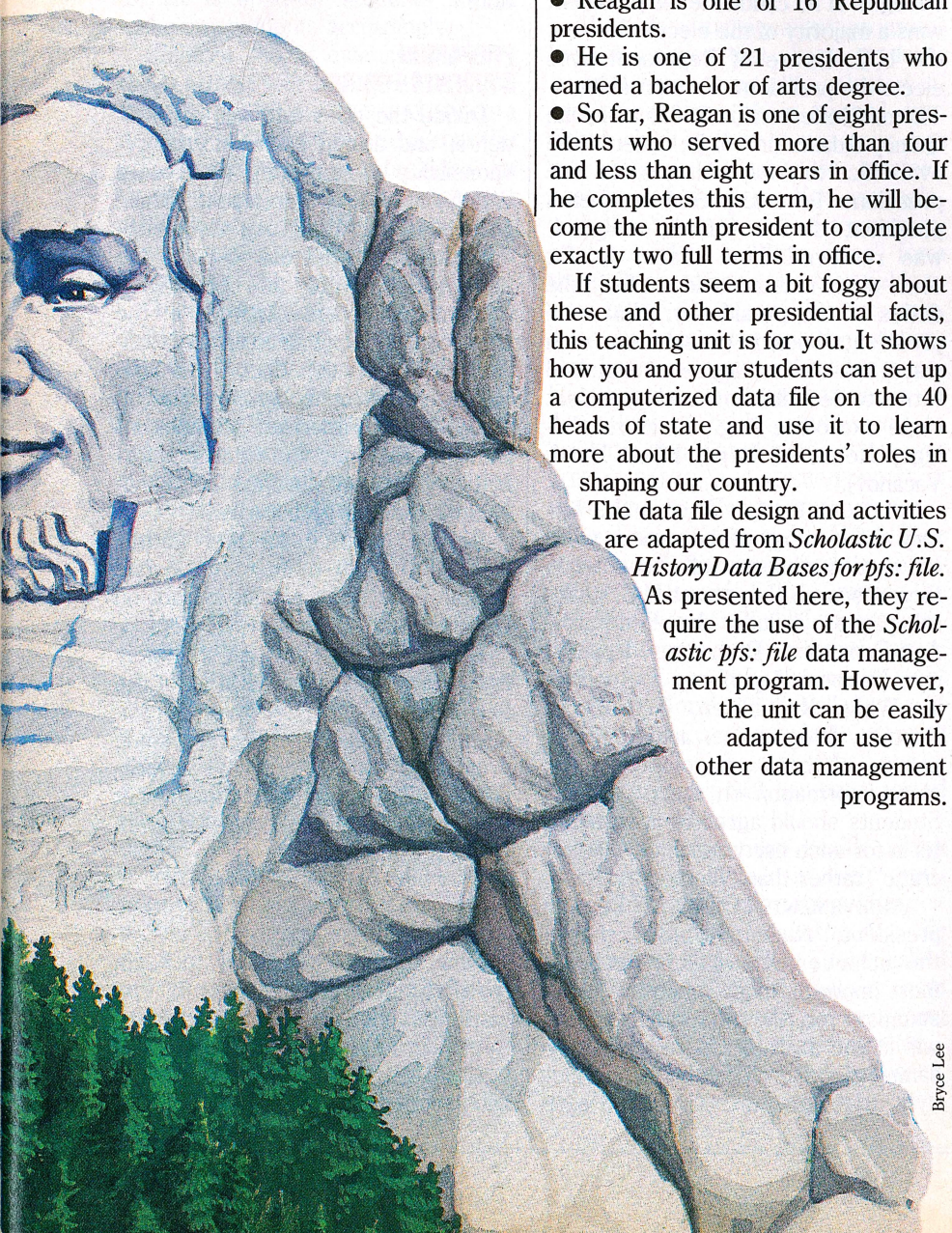


This year, February 17 is Presidents' Day — the day we celebrate all the birthdays of past and present presidents of the United States. How much do your students know about the presidents and their roles in American history? Take time out on Presidents' Day to ask a few questions. For example, do

I D E N T S

children know these facts about their current president, Ronald Reagan?

- Reagan is our fortieth president.
- He is the only president who was born in Illinois.
- Before he became president, Reagan had been a motion picture actor, sportscaster, rancher, businessperson, author, and governor of California. Besides Reagan, 14 U.S. presidents were state governors before being elected president; none had ever been an actor.
- At age 69, Reagan was the oldest person to become president of the United States. Seven other presidents were more than 60 years old when they were inaugurated.
- Reagan is one of 16 Republican presidents.
- He is one of 21 presidents who earned a bachelor of arts degree.
- So far, Reagan is one of eight presidents who served more than four and less than eight years in office. If he completes this term, he will become the ninth president to complete exactly two full terms in office.



Bryce Lee

If students seem a bit foggy about these and other presidential facts, this teaching unit is for you. It shows how you and your students can set up a computerized data file on the 40 heads of state and use it to learn more about the presidents' roles in shaping our country.

The data file design and activities are adapted from *Scholastic U.S. History Data Bases for pfs: file.* As presented here, they require the use of the *Scholastic pfs: file* data management program. However, the unit can be easily adapted for use with other data management programs. (Access to a printer is essential for this project.)

If you have never used data management software before, read the box titled "Data Base Primer," page 16, for important introductory information.

DESIGNING A DATA FILE

When creating a data file, the first thing you must do is to develop a structural design that each data record will follow. The worksheet on page 17 shows a sample design for a record on a U.S. president. When transferred to the computer, this record should fill three screens. This allows children enough space to enter detailed political and personal information about a president, and to list the sources from which the information was taken.

Feel free to tailor the file design to suit your curriculum needs and the make-up of your particular data management program. Then make at least one copy of the worksheet for each of your students.

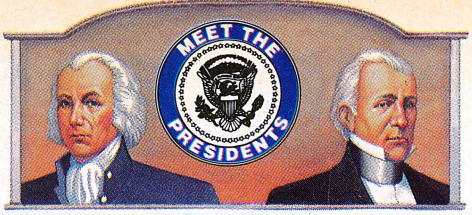
DISCUSSING TERMS IN THE FILE

Before students begin gathering information for the file, they need to be given a standard format for filling in the fields for each record. (If you have used a computerized data file, you know how difficult it is to retrieve data if it has not been spelled correctly and input in a similar way.)

Write the names of your fields on the chalkboard. As a class, discuss standard formats to use for recording data in each. Following is how your class could record data for fields in the first screen of the sample record on page 14.

NAME: The format for filling in a president's name is last name, then first name.

(continued)



(continued from page 13)

KNOWN POPULARLY AS: Students fill in this field with a popular nickname for the president, such as "Teddy" for Theodore Roosevelt, or with a popular phrase, such as "First in war, first in peace, first in the hearts of his countrymen" for George Washington.

TERM OF OFFICE: Students should fill in two years for each president: the year the president first served and the year he left the office. For example, President Jimmy Carter's term would be filled in this way: FROM: 1976 TO: 1980.

HOW BECAME PRES.?: The usual way a person becomes president is by winning a presidential election that is conducted every four years. To win a presidential election, one must acquire a majority of electoral votes (winning the popular vote is not enough). If no candidate for president wins a majority of the electoral votes, the U.S. House of Representatives elects the president. Two presidents, Thomas Jefferson (in 1801) and John Quincy Adams (in 1825), entered the oval office this way. Also, some vice presidents became president when a president died in office, resigned, was removed from office, or for some other reason could not fulfill the duties of the presidency. Nine vice presidents became president in such ways. As a class, agree on standard terms to describe how each president came into office (e.g., Electoral College, House of Reps, Filled Death Vacancy).

POLITICAL PARTY: Discuss the history and ideology of the various political parties students will encounter in their research. Important U.S. political parties include the Federalist, Anti-Federalist, Democratic-Republican, National Republican, Democratic, Whig, Republican, Greenback, Populist, Progressive, and American parties. (Check encyclopedias for more information on these parties.) Students should agree on a standard term for each party, such as "Democratic" rather than "Democrat."

ACHIEVEMENTS IN OFFICE: For each president, students should choose the achievements which were his most important and compose a short summary on them (something that will fit the available space). Here's a sample summary of John F. Kennedy's achievements: "Created Peace Corps; ordered naval blockade of Cuba during Missile Crisis; ordered end to racial discrimination in federally-subsidized housing."

EVENTS DURING ADMINISTRATION: Students should compose a short summary of the most important U.S. events that took place during the president's administration. For example, during Lyndon B. Johnson's administration, the following important events took place: "Gulf of Tonkin incident (beginning of Vietnam War); first walk in space; Vietcong Tet offensive; assassinations of Martin Luther King, Jr. and Robert Kennedy; riots outside Democratic convention."

AMERICAN PRESIDENTS

NAME: Washington, George
KNOWN POPULARLY AS: "First in war, first in peace, first in the hearts of his countrymen."
TERM OF OFFICE
FROM: 1789 TO: 1797
HOW BECAME PRES.?: Electoral College
POLITICAL PARTY: None
ACHIEVEMENTS IN OFFICE: Set an example for future presidents; two terms; created the first Cabinet (department heads); put down Whiskey Rebellion; signed the Jay Treaty
EVENTS DURING ADMINISTRATION: Clashes between Alexander Hamilton (Sec. of Treasury) and Thomas Jefferson (Sec. of State) cause formation of first political parties; French Revolution

PERSONAL DATA
NAME: George Washington
BORN: 1732 DIED: 1799
BIRTHPLACE: Westmoreland County, VA
EDUCATION: Finished schooling at age 15
PREVIOUS OCCUPATION(S): Surveyor
PREVIOUS EXPERIENCE: Fought in French and Indian War; Commander of Continental Army
NAME OF "FIRST LADY": Martha Custis
HER CONTRIBUTIONS: Traveled long distances during the Revolutionary War to share her husband's hardships; organized a women's sewing circle to mend clothes for the troops.

REFERENCES:
Webster's American Biographies 1979, pp. 1097-1099
The World Book Encyclopedia 1985, pp. 85-86

A sample record on George Washington.

PREPARING STUDENTS FOR RESEARCH

Divide the class into pairs of students, and assign each pair the responsibility of gathering the record data for at least one president. (Make sure all 40 presidents are assigned.)

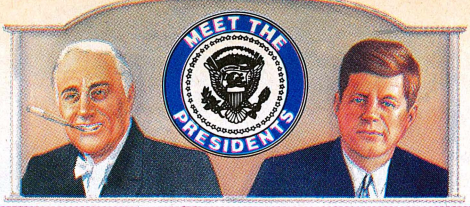
Arrange for students to go to the school library to use reference sources, or provide sources in the classroom. (Helpful reference materials include encyclopedias, the *Dictionary of American Biography*, and biographies of American presidents.) Students also may find valuable information in county libraries, local museums, and college libraries.

Before having students gather data, work with them to fill in one sample form. (See sample record on George Washington, at left.)

Explain to students that they may not always be able to fill in all of the fields on the form for every president. For example, there are some presidents who do not have a nickname or a quote about them that could be inserted in the KNOWN POPULARLY AS: field.

GATHERING AND ENTERING DATA

Now students are ready to begin research. Distribute copies of the worksheet on page 17. Tell children to use their reference materials to fill in the worksheets. At the bottom of each worksheet, under REFERENCE,



students should jot down the titles of the sources (and the page numbers) they used to get their information.

Once children have filled in at least one form, have them exchange forms and check them for accuracy. To check a form, students should look up the information in the books listed on the worksheet under REFERENCE. They should check for factual accuracy as well as correct spelling and abbreviation, and make corrections as needed.

Have students check the format of the data also. For example, are the dates for TERM OF OFFICE written in the correct format? If an incorrect format is spotted, students should make amendments accordingly.

Children should examine carefully the ACHIEVEMENTS IN OFFICE and EVENTS DURING ADMINISTRATION data items. If students don't think that the achievements and events listed on the data form are the most important ones to put in the file, they should discuss other possibilities with the classmates who wrote the data.

Once forms have been checked, children can take turns entering the data into the computer. For this task, it's best for students to enter data from forms that they themselves did not fill in or check. One person should type while a partner reads the instructions and data. Each partner should check the data for accuracy.

USING THE FILE

Your students have now created a file of data about the presidents that can help them study a variety of questions, such as:

- Which presidents came into office without being elected?
- What are the most common previous occupations of American presidents?
- What state has produced the greatest number of presidents?
- Which president served the longest term in office?
- Is there any relationship between length of term in office and the achievements made by a president?
- Is there any relationship between length of term in office and whether the country was at war?
- Which first ladies made important contributions to our country?
- Looking at Republican presidents as a group and Democratic presidents as a group, are there any major differences in the groups' achievements?
- Did most presidents hold a political office prior to becoming president?
- Which presidents were most effective?

Have each student choose one of the previous questions or define a different question on the presidents and use the data file to produce a printout that is useful in answering the question.

Most data management programs have a function that allows students to print lists of specially selected information from their record file. Teach children how to use your data management software to retrieve specific information. For example, with the *Scholastic pfs: file* program, students fill in a "Print Spec" form that tells the computer which fields to print from each record. For example, if the question examines the relationship between various presidents' political parties and achievements in office, they probably would want to print the data listed in the NAME, POLITICAL PARTY, and ACHIEVEMENTS IN OFFICE fields only.

Students also use the Print Spec form to tell the computer how to organize the records before printing the list. For example, if children are looking at the presidents' political parties and achievements, they might want to sort the forms so that all the presidents for one party would be grouped together. (The box at right shows a sample report that has been sorted by political party.)

Students must also decide which presidents to include in their printout: all or a specific group of presidents. With the *Scholastic pfs: file* program, students fill in a form called the "Retrieve Spec" that allows them to specify the criteria for selecting which presidents to print forms for.

Once students have their printout, they can use it to answer their question. Sometimes the printout provides more information than students need. If that happens, tell students to circle the information on the printout that is directly related to their question and then use that information to draw their conclusions.

To answer some questions completely, children may need to get several different printouts and make lists from these printouts. For example, to answer the question, "Is there any relationship between length of term in office and whether the country was at war?" students may choose to sort one printout by TERM OF OFFICE. From the printout, stu-

```
POLITICAL PARTIES OF THE PRESIDENTS
Cleveland, Grover (second term)
  Democratic
Wilson, Woodrow  Democratic
Carter, James E.  Democratic
Johnson, Lyndon B.  Democratic
Kennedy, John F.  Democratic
Truman, Harry S.  Democratic
Roosevelt, Franklin D.  Democratic
Cleveland, Grover  Democratic
Buchanan, James  Democratic
Pierce, Franklin  Democratic
Polk, James K.  Democratic
Van Buren, Martin  Democratic
Jackson, Andrew  Democratic
Adams, John Quincy
  Democratic-Republican
Monroe, James
  Democratic-Republican
Madison, James
  Democratic-Republican
Jefferson, Thomas
  Democratic-Republican
Adams, John  Federalist
Johnson, Andrew  National Union
Washington, George  None
Harrison, Benjamin  Republican
Reagan, Ronald W.  Republican
Ford, Gerald R.  Republican
Nixon, Richard M.  Republican
Eisenhower, Dwight D.  Republican
Hoover, Herbert C.  Republican
Coolidge, Calvin  Republican
Harding, Warren G.  Republican
Taft, William H.  Republican
Roosevelt, Theodore  Republican
McKinley, William  Republican
Arthur, Chester A.  Republican
Garfield, James A.  Republican
Hayes, Rutherford B.  Republican
Grant, Ulysses S.  Republican
Lincoln, Abraham  Republican
Fillmore, Millard  Whig
Taylor, Zachary  Whig
Tyler, John  Whig
Harrison, William H.  Whig
```

This sample data report, printed with Scholastic pfs: file, *sorts the presidents by their political parties.*

(continued)

(continued from page 15)

dents make a list of presidents that served the longest terms (headed by Franklin D. Roosevelt, who was elected four times) and another list of presidents that served the shortest terms (headed by William H. Harrison who died a month after his inauguration). Then they compare those lists with a printout of presidents in office during wars.

In some cases, the data in the file can only give part of the answer to students' questions. They may need to look up additional information in the library. For example, to answer the question, "Which presidents were most effective?" children may need to consult critical biographies and political editorials published in newspapers and magazines.

It might be fun to tape everyone's printout on the wall for a couple of days, so all students will have a chance to study the data. Have students discuss with their classmates what they learned from their printouts. Also ask them to write up their findings and report them to the class.

ADDITIONAL ACTIVITIES

Here are some class projects students can do using data from their files.

- Conduct a panel discussion on the topic, "How to Prepare to Become a United States President." To prepare for the discussion, have student panelists examine file printouts that show the education, political party, previous occupations, and previous experience of U.S. presidents. Note how many presidents were politicians, lawyers, and bankers.
- Make a bulletin board display of the U.S. presidents. At the top of the board, tack paper letters that read: "Hail to the Chiefs!" Use your data file to prepare special printouts that illustrate interesting collections of data about certain presidents, such as all the presidents born in Ohio, all the presidents who didn't attend college, or all the presidents who were former teachers. Tack these printouts and students' sketches of favorite presidents throughout the board.
- Role-play the presidents. Have each student select a president and use information from the file to prepare a hypothetical speech the president might give to the American people of his time. For example, President Coolidge may talk about Charles Lindbergh's flight across the Atlantic, while President Lincoln would probably address the issue of slavery. Students will find information in the ACHIEVEMENTS IN OFFICE and EVENTS DURING ADMINISTRATION fields particularly helpful in writing their speeches. They also may need to consult additional sources, such as newspaper and magazine articles from the time period, to make their speeches historically accurate.

Have children take turns presenting their speeches to the class, without telling classmates which president they are. Encourage children to incorporate physical clues, such as military attire for President Grant or cowboy boots for President Reagan, into their role-playing. The other students try to guess which president their classmates are "playing."

- Write a "help wanted" advertisement for the job of U.S. president in the year 2000. What kind of qualifications do kids think the future president should have? What past experiences would be helpful? What previous occupations? Compare these qualifications to those needed in a president during the early 1800s.

Beverly Hunter is the developer of a series of data management instructional packages for social studies, science, and language arts called *Scholastic pfs: Curriculum Data Bases.* Material for this article came from the package titled *Scholastic pfs: U.S. History Data Bases.* ***Dr. Mary Furlong*** is co-author of *Scholastic pfs: U.S. History Data Bases.* She is also associate professor in the Department of Education at the University of San Francisco.

DATA BASE PRIMER

For Beginners Only

A data base management program is like an electronic filing cabinet or a computerized index-card box. It is a piece of software that lets you organize, store, and retrieve information.

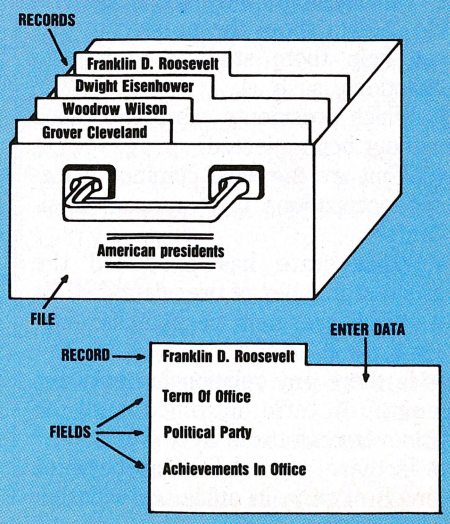
All data management programs contain three important elements: fields, records, and files.

1. Field: A field is a category or item of information. For example, in the U.S. presidents data file in this feature, TERM OF OFFICE, POLITICAL PARTY, and ACHIEVEMENTS IN OFFICE are fields.

2. Record: A record is a collection or listing of related fields. In the U.S. presidents data file, the information in the fields TERM OF OFFICE, POLITICAL PARTY, and ACHIEVEMENTS IN OFFICE for Franklin D. Roosevelt would be in one record. The TERM OF OFFICE, POLITICAL PARTY, and ACHIEVEMENTS IN OFFICE for Woodrow Wilson would make up another record.

3. File: A file is a collection of related records. The record for Franklin D. Roosevelt, the record for Woodrow Wilson, and records for the 38 other U.S. presidents would make up a file.

PARTS OF A DATA BASE



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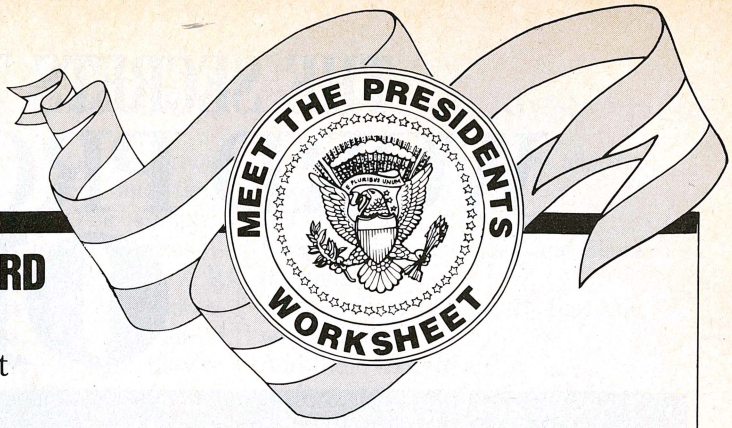
YOUR NAME: _____



AMERICAN PRESIDENTS DATA RECORD

DIRECTIONS: Use a reference book to find information about a U.S. president, and write it in the spaces provided below.

NAME: _____

KNOWN POPULARLY AS: _____

TERM OF OFFICE

FROM: _____ TO: _____

HOW BECAME PRES.? _____

POLITICAL PARTY: _____

ACHIEVEMENTS IN OFFICE: _____

_____

_____

EVENTS DURING ADMINISTRATION:

_____

_____

PERSONAL DATA

NAME: _____

BORN: _____ DIED: _____

BIRTHPLACE: _____

EDUCATION: _____

PREVIOUS OCCUPATION(S): _____

PREVIOUS EXPERIENCE:

_____

_____

NAME OF "FIRST LADY": _____

HER CONTRIBUTIONS: _____

_____

_____

REFERENCES

_____

_____

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THE SECRETS TO TEACHING WORD PROCESSING OR

the LEGACY of Morris Q. Moneybucks

Where there's a "will," there's a way to teach word processing skills. Help the heirs to Morris Q. Moneybucks' estate find missing family heirlooms, and your kids will develop word processing skills in the "process!"

BY THOMAS E. BOUDROT

This feature is really two articles in one. First and foremost, it is an article about how to help kids develop word processing skills. One of the "secrets" to doing this is to break instruction down into bite-size lessons, each of which introduces and helps develop one of five basic word processing skills. On the following pages you will find a student lesson on each of these skills:

- **File Retrieval.** This usually refers to the ability to retrieve or call up information from a disk.
- **Cursor Movement.** The cursor, that video marker that indicates where type will next appear on the screen, is essential to word processing. With the help of a word processing program, the cursor can move about and make corrections anywhere in text.
- **Text Deletion.** This is the process of removing characters, words, or blocks of type from text.
- **Text Insertion and Replacement.** The process of inserting characters, words, or blocks of type. Sometimes this is done in place of other text (*text replacement*); sometimes in addition to other text (*text insertion*).
- **Text Creation.** This is the sum of the previous four skills. Put them all together, and you are ready to create an original sentence, paragraph, story, poem, or essay. Words are now easily added, deleted, or otherwise moved about the screen. You'll be amazed how much quicker creativity comes.

Another "secret" to teaching word processing effectively is to incorporate language arts exercises into every lesson. This makes children aware of how word processing can make writing easier; hence, encouraging them to learn the necessary skills. The activities in this feature provide experience with editing, writing, and many other language arts skills, and can be performed on any word processing software.

This article has a second side to it. It is also the tale of the late Morris Q. Moneybucks and the outrageous incidents that result after the reading of his last will and testament. Morris was an eccentric old fellow who had original ideas on how his personal possessions should be divided among his three children, Doris, Horace, and Chloris . . . oh yes, and their faithful butler, Max. The complex story of his legacy unwinds throughout these word processing lessons. It is loaded with family intrigues, mysterious messages, and convoluted codes. Don't worry, though: they're all meant in fun. (Morris took care that no one would leave his estate empty-handed.)

This fascinating saga will motivate even the most reluctant word processor to work on and learn the five basic skills!

ACTIVITY 1:

HIDDEN PRIZE

Word Processing Skill: File retrieval.

Language Arts Skills: Following directions, making inferences.

Materials: Scrap paper, Student Task Card 1, and eight special data files: NOTE, CLOCK, PORCH, SINK, CELLAR, OVEN, CLOSET, and PIANO.

Preparation: Using a word processing program, create the following eight files:

NOTE

The first relative to read this note
Will get a special prize,
If he figures out the clues I wrote
And hid from greedy eyes.

Start at the clock and read the clue.
I'm serious; this is not funny!
Write down the letter that fills the the blank.
It's worth a lot of money.
Keep reading my clues and filling their blanks.
Then look at the letters that you wrote down.
Add them together,
And see what you've found.

CLOCK

I have a _orch at the front of my mansion. Go there to find the second clue.

PORCH

There is a large s_nk in the kitchen. Go there for your next clue.

SINK

Way down in the cell_r is the next clue to this mystery. Are you stumped yet?

CELLAR

The ove_ is a great place for baking and for hiding clues! I'll give you another hint: you're getting warmer!

OVEN

Deep inside my bedroom cl_set you will find the last clue.

CLOSET

Read the five letters you have used to fill the blanks. They spell the name of my favorite musical instrument. Look into that to claim your prize.

(continued)

CUT OUT AND LAMINATE

TASK CARD 1
Hidden Prize

When Horace arrived at the mansion of his father, the late M.Q. Moneybucks, he found a note. It was written in poetic form.

Horace isn't too smart. See if you can help him follow the instructions on the note.

1. Retrieve the file called NOTE. It will lead you to a second file. Plug in the letter that goes in the blank space on the second file and it will lead you to another file.

2. There are five files that work like this. Write down the missing letter in each file, put the letters together, and you'll find the file that tells what Morris left Horace.

3. You really deserve a part of the prize for helping out. Is it something that can be shared?

Suzanne Hughes Sullivan

CUT OUT AND LAMINATE

TASK CARD 2
House Hunt

Complete Task Card 1 before you try this card.

Chloris, the youngest Moneybucks, was furious that her brother Horace found the walrus tusks first.

Chloris decided to see if there was something else to steal . . . er, find in the house.

1. Call up the HOUSE file. Tape the maze transparency of Morris' house to the screen. Be sure that the periods on the screen are underneath the lines of the maze on the transparency.

2. Position the cursor at the word START, then move your cursor through the maze of the mansion and "revisit" (in order) the seven places that Horace visited in Activity 1: the clock, porch, sink, cellar, oven, closet, and piano. Write down letters you find along the way .

3. What do they spell? Could it be the family heirloom that Chloris has been searching for?

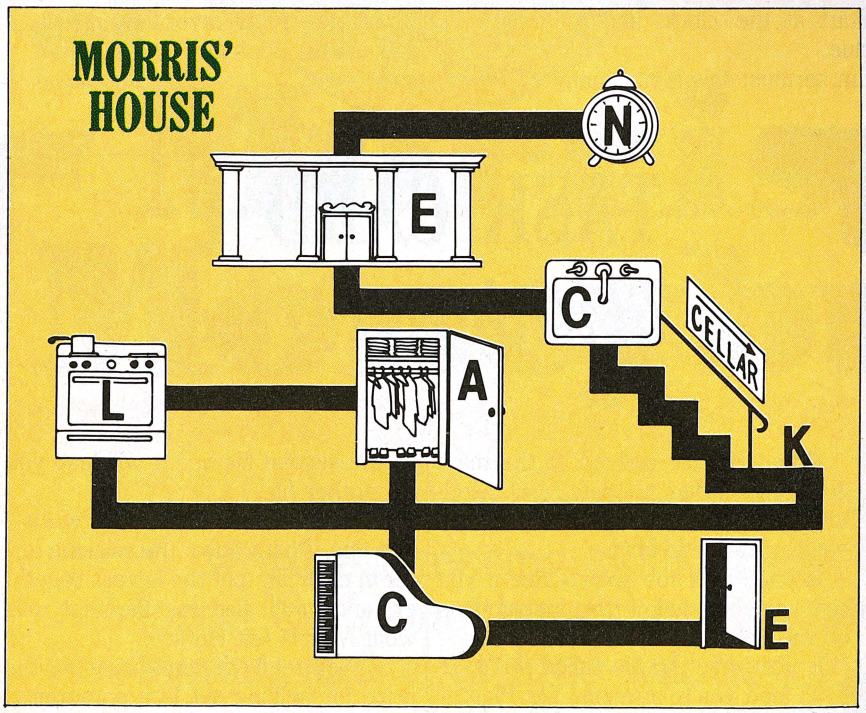
PIANO
Congratulations! You now own my walrus tusk collection. I know that it will bring you great happiness. By the way, please dust the piano when you finish reading this note. I'd appreciate it!
Sincerely, Morris Q. Moneybucks

Cut out and laminate Student Task Card 1.

Demonstrate how to load a word processing program. Then show students the disk (or cassette) on which the eight files for this activity are stored. Boot up the disk and teach the class how to retrieve the file called NOTE.

Next, give children a little background on Morris Q. Moneybucks. Morris was not your ordinary rich man. He was what you might call an "eccentric." He left a will to his three children, but he also left notes all over his mansion that promised still another treasure to the first relative to arrive at his mansion and solve the clues in his notes. That's what this activity is all about.

Activity: There are eight notes in all; each is stored in a different data file and has a secret file name. Tell students to start their search for Morris' notes with the NOTE file they just called up. Each note, including this one, contains a clue to finding the file that follows it. The eighth file contains the prize. Students who can retrieve each file correctly will find what it is that Morris has left for the lucky relation who arrives at his mansion first. *(A walrus tusk collection!)*



Make a transparency of Morris' house — the site of many hidden treasures.

ACTIVITY 2:

HOUSE HUNT

Word Processing Skill: Cursor movement.

Language Arts Skills: Following directions, making inferences.

Materials: A transparency of Morris' house (sample on this page), transparent adhesive tape, Student Task Card 2, and the HOUSE text file.

Preparation: Using your word processing program, make a screen full of periods. Save them under the file name HOUSE.

On a blank transparency sheet, draw Morris' house (as shown on this page). Tape the transparency to the screen. Be sure that when you call up the HOUSE file, the periods on the screen are aligned directly under the lines on the transparency. Position the cursor at the START position.

Cut out and laminate Student Task Card 2.

Review cursor movement with the kids. Demonstrate how the cursor can be moved through the HOUSE file.

Tell students that Chloris, one of Horace's two sisters, is convinced that there are more treasures to be found in the Moneybucks' mansion. It is their job in this activity to help her locate them.

Activity: Make sure the cursor is at the START position on the transparency of Morris' house. Then have

CUT OUT AND LAMINATE

TASK CARD 3

Twice-Typed Text

Complete Task Card 2 before you try this card.

Morris' faithful butler Max uncovered an unusual letter while cleaning. Call up the DOUBLE file and read it.

1. Sometimes the old electric typewriter that Morris used typed double letters where only a single letter belonged. Can you find examples of this in his note? Delete second letters wherever they do not belong.

2. Make a printout of your work. Then save it under a new file name so that you can call it up again if necessary.

students follow the directions on Activity Card 2. They are asked to "revisit" the house locations that Horace explored in Activity 1. At each stop on their journey they will find a single letter. Tell them to keep track of all eight letters that they come to. The eight letters together spell the name of an additional treasure that Horace overlooked. *(A necklace.)*

ACTIVITY 3:

TWICE-TYPED TEXT

Word Processing Skill: Text deletion.

Language Arts Skill: Determining correct spelling of words in a passage.

Materials: The text file DOUBLE and Student Task Card 3.

Preparation: Using your word processing program, type the following file into the computer. (Be sure to include misspellings.) Save the file on a blank disk or cassette under the name DOUBLE.

FILE: DOUBLE

My dear Maax,

My childreen, as you may rememmber, are a bitt selfish. I know they will be angry iff you receive too many items from my estaate. I am writing this letter, therefore, to tell you off things thhat I have hidden foor you in thee attic.

Among the thinngs I have saved forr you are my bowlling ball, the entirre soda bottle collection, twellve beetle boxxes, and my green books.

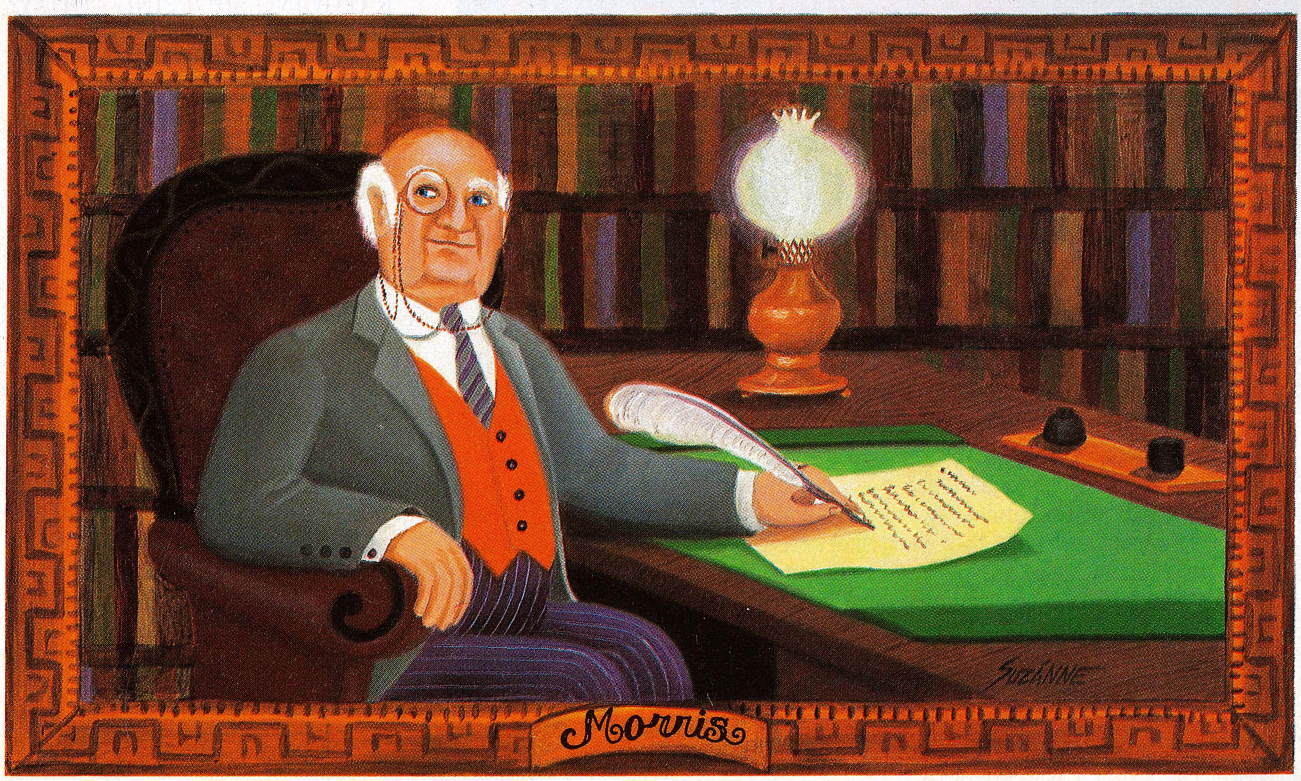
Be certain to remoove the items whhen Doris, Horace and Chloriss are not loooking. Don't get caaught!! Sincerely, Morris Q. Moneybucks

Show children how to delete text on the video screen. Then show them how to save a data file on a blank disk or cassette.

Cut out and laminate Student Task Card 3.

Activity: Tell students to call up the

(continued)



CUT OUT AND LAMINATE

TASK CARD 4
Too Short for Words

Complete Task Card 3 before you try this card.

Doris, the final inheritress of the Moneybucks fortune, lived in Washington, D.C., about 900 miles away from the mansion. When the bad news about Morris came, she packed her dog, Waldo, and her Siamese cats into her car (she was afraid to fly) and started out for the mansion. The journey went smoothly for the first mile or so. Then the car broke down.

Doris immediately sent a telegram to the butler, Max. (She was afraid of what her brother and sister might be up to without her.)

1. Call up the TELEGRAM file and read what Doris said to Max. Doris shortened many of the words in the telegram so that it would be cheaper for her to send. Change the shortened words that she used into correctly spelled words.

2. Make a printout of your work. Then save it under a file name of your choice.

DOUBLE file and follow the instructions on Student Task Card 3. The card tells them to delete all the extra letters they find in the words in the DOUBLE text. Have kids make a printout of their work and then save it on a disk or cassette.

ACTIVITY 4:

TOO SHORT FOR WORDS

Word Processing Skills: Text insertion and replacement.

Language Arts Skill: Determining word meaning through context.

Materials: TELEGRAM text file and Student Task Card 4.

Preparation: Using your word processing program, type the following file into the computer. Save the file on a blank disk or cassette under the name TELEGRAM.

FILE: TELEGRAM

DEAR MAX,

I M VERY SAD 2 HEAR ABOUT MORRIS. I M ON MY WAY TO D MANSION. MY CAR BROKE DOWN. I L B A LITTLE LATE.

PLEASE COLLECT MY THINGS SO HORACE N CHLORIS DO NOT TAKE M. I M BRINGING MY DELICIOUS BROWNIES 2 U. (NO LOOT, NO BROWNIES).

R U GOING SHOPPING TODAY? Y DON'T U HAVE A BONE READY 4 WALDO WHEN WE ARRIVE? HE WOULD LOVE 1.

SINCERELY,
DORIS

Show students how to insert and replace words in an existing text file.

Cut out and laminate Student Task Card 4.

Activity: Tell children to call up the TELEGRAM file and follow the instructions on Student Task Card 4. The card tells them to replace all the shortened word symbols they find in the TELEGRAM file with correctly spelled words. For example, "sad 2 hear . . . " should be replaced with "sad to hear . . ." and "I L B A little late" should be replaced with "I will be a little late."

When they're finished, have students make a printout of their work and exchange it with a neighbor to check spelling. Then save the work on a disk or cassette.

ACTIVITIES 5 – 8

INVITING ACTIVITIES AND MORE

Word Processing Skills: Text creation, plus additional practice with the four word processing skills previously introduced.

Language Arts Skills: Letter composition, following directions.

Materials: INVITE text file and Student Task Cards 5, 6, 7, and 8.

Preparation: Using a word processing program, type the following file into the computer. Save it under the name INVITE..

FILE: INVITE

Doris Moneybucks
and Wilbur Weedwacker
cordially invite you
to their wedding.
PLACE:_____
ADDRESS:_____

_____
DATE:_____
TIME:_____
RECEPTION:_____

Kindly RSVP (that's French for "let us know if you can make it").

Cut out and laminate Student Task Cards 5–8.

CUT OUT AND LAMINATE

TASK CARD 5
An Inviting Activity

Complete Task Card 4 before you try this card.

Doris surprised everyone: she decided to marry Wilbur, the man who repaired her car! After some thought, the couple decided it would be best to get married in Transylvania. (Wilbur is a castle buff.)

1. Call up the INVITE file. You will find the beginnings of a wedding invitation.
2. Complete the invitation to show the following information:
PLACE: Transylvania Castle
ADDRESS: 1313 Vampire Court, Transylvania
DATE: October 31, 1986
TIME: Midnight
RECEPTION: Pumpkin pie will be served.
3. Make a printout of your completed invitation. Also, save it under a file name of your choice.

Activity: Have students call up the INVITE file and complete Student Task Cards 5–8, in order. In cards 5 and 6, kids are asked to insert and change information on the wedding invitation found in the INVITE file. In cards 7 and 8, students are instructed to write original letters to Doris taking the roles of Horace and Chloris, respectively.

For each activity, students make a printout of their work and then save it under a file name of their choice.

Thomas E. Boudrot is a computer coordinator for instruction in the Alief Independent School District in Alief, TX. He is also the author of *Byte-Sized Activities: The Generic Word Processing Activity Book* (Scott, Foresman and Company; 1985).

(continued on page 59)

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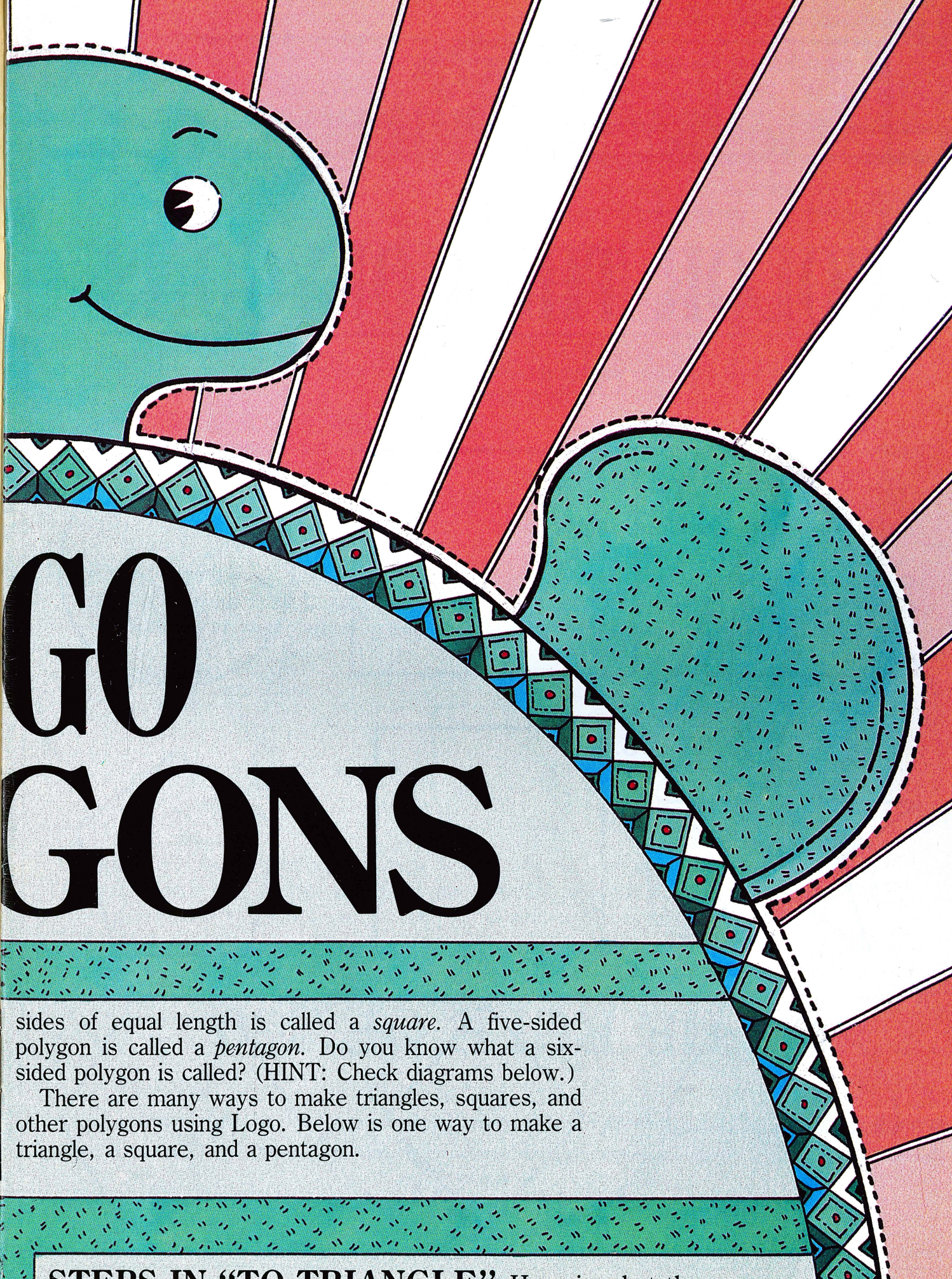


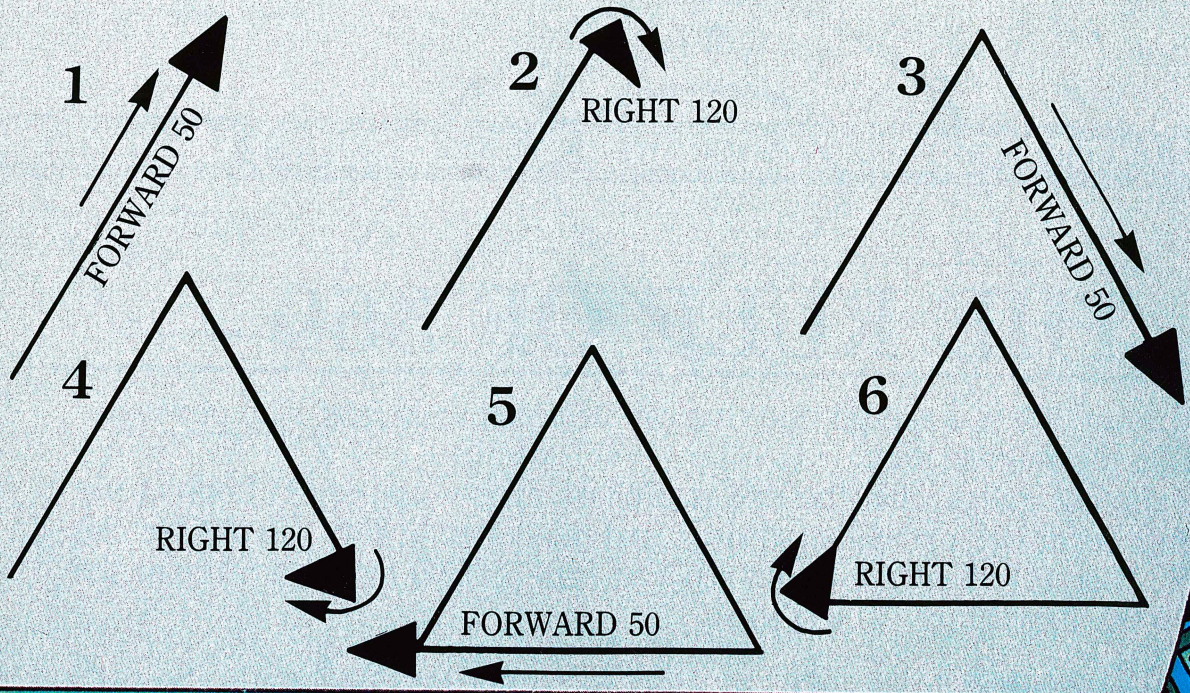
GO GONS

sides of equal length is called a *square.* A five-sided polygon is called a *pentagon.* Do you know what a six-sided polygon is called? (HINT: Check diagrams below.)

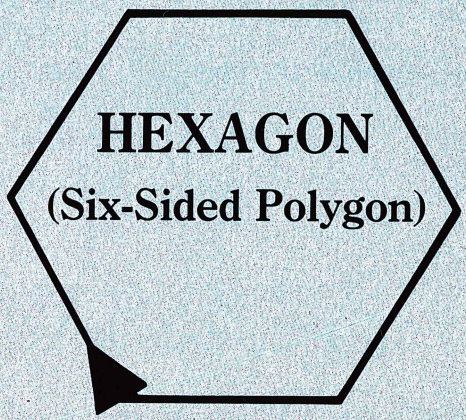
There are many ways to make triangles, squares, and other polygons using Logo. Below is one way to make a triangle, a square, and a pentagon.

STEPS IN "TO TRIANGLE" Here is what the

STEPS IN TO TRIANGLE Here is what the triangle procedure at left tells the computer to do.



RE GONS



HEXAGON
(Six-Sided Polygon)

AGON
Sided
gon)

Can you complete this procedure?
TO HEXAGON

_____

END

TAGON
AT 5 [FORWARD
IT 72]

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MICRO TIMES™

The mini-magazine for kids who love computers.

Published by Scholastic Inc. February 1986

Space Probes to Meet Comet

Halley's comet is a ball of frozen ice and gas. As Halley approaches Earth, space probes will study its make-up closely.

Next month, for the first time ever, special spaceships, called *space probes*, will meet Halley's comet in outer space.

A *comet* is a ball of ice, gas, and dust that travels through space. Halley's comet passes by our planet about once every 76 years. On its last visit in 1910, telescopes were the best tool scientists had to study the comet. The telescopes couldn't show exactly what kinds of gases and dust particles made up Halley's comet.

Now, with the help of space-probes, scientists can study the comet much more carefully. The space probes will not carry humans, just computer-controlled instruments. The instruments will do things like photograph the comet, measure its size, and study its gas and dust particles. They will send, or *relay*, this data back to scientists on Earth.

Scientists around the world will use the information to learn more about comets.

Four major probes will meet Halley's comet. They are Giotto (*JO*-to), Vega 1, Vega 2, and Planet-A. On the next page are pictures of them. *(continued)*

INDEX

Space Probes 1,2
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Written by Lorraine Hopping.

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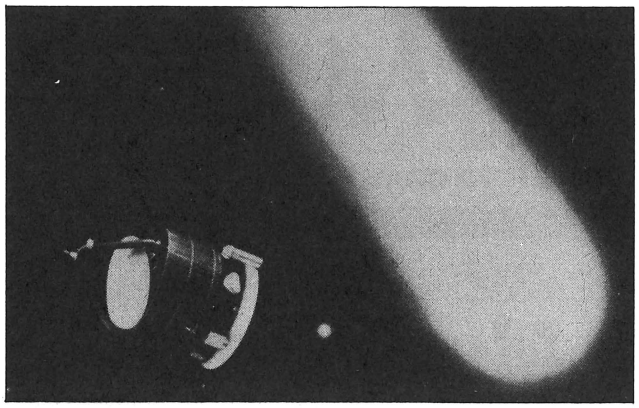
Space Probes *(continued)*

Photo Courtesy of European Space Agency

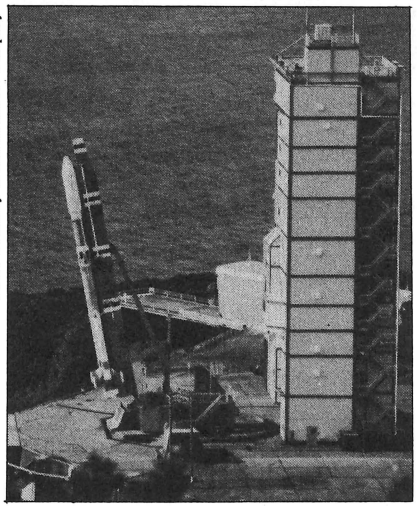


Giotto

Sent By: European Space Agency (includes 11 countries).
Launch Date: July 2, 1985.
Meets Halley: March 14, 1986.
Closest Point to Comet: 500 kilometers (310 miles).

Of the four probes, Giotto will fly the closest to Halley's comet. Its top speed will be 42 miles *per second.* Giotto will have about two hours to gather and send data back to Earth. Afterward, the probe will probably be destroyed by the comet's particles.

Photo Courtesy of Nissan Motor Company

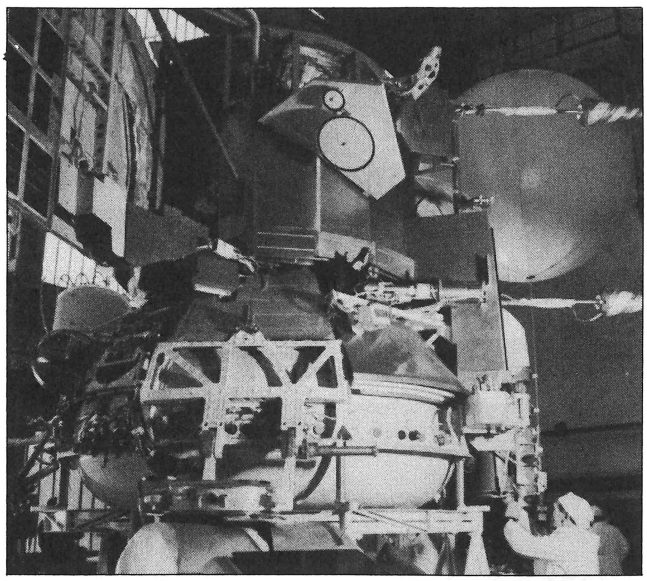


Planet-A

Sent By: Japan.
Launch Date: August 14, 1985.
Meets Halley: March 8, 1986.
Closest Point to Comet: 100,000 kilometers (62,000 miles).

The Planet-A probe, shown here before lift-off, will study the effects of the sun on Halley's comet. For example, wind from the sun blows the comet's gas and dust particles into a long, streaming tail. As the comet moves away from the sun, the wind is not as strong and so the tail shrinks.

Photo Courtesy of Tass From Sovfoto



Vega 1 and Vega 2

Sent By: Soviet Union.
Launch Dates: December 14, 1984 (Vega 1) and December 20, 1984 (Vega 2).
Meet Halley: March 6, 1986 (Vega 1) and March 9, 1986 (Vega 2).
Closest Point to Comet: 10,000 kilometers (6,000 miles).

Vega 1 will be the first probe to fly by Halley's comet. Computers on board the probe will keep TV cameras focused on the comet's center. The pictures will help scientists decide how close to the comet Vega 2 should fly. They will also help scientists steer the Giotto probe away from the comet's hard center.

Review Questions

1. How often does Halley's comet pass by Earth?

2. On the comet's last visit, what tool did scientists use to study it?

3. How will space probes help scientists study the comet?

4. How many months will it take each of the probes to reach the comet?

5. Which of the four major probes will fly closest to Halley's comet?

6. Which probe will fly by the comet first?

7. What will the Planet-A probe study?

8. In 2061, Halley's comet is due to pass by Earth again. How do you think future scientists will study the comet on its next visit? Will they send space probes again? Will they fly into space to meet it face to face?

PROGRAM LISTING:

City Buildings

BY LEONARD HUBER

Most buildings are shaped like rectangles. And yet, they all look a little different.

For example, some buildings, such as the Sears Tower in Chicago, are very tall and narrow. Others, such as the Capitol building in Washington, D.C., are wider than they are tall.

Also, many buildings have fancy roofs. For example, the roof of the Empire State Building in New York City has tiers (levels) that gradually get smaller. On the very top is a giant antenna.

You can design your own buildings using Logo.

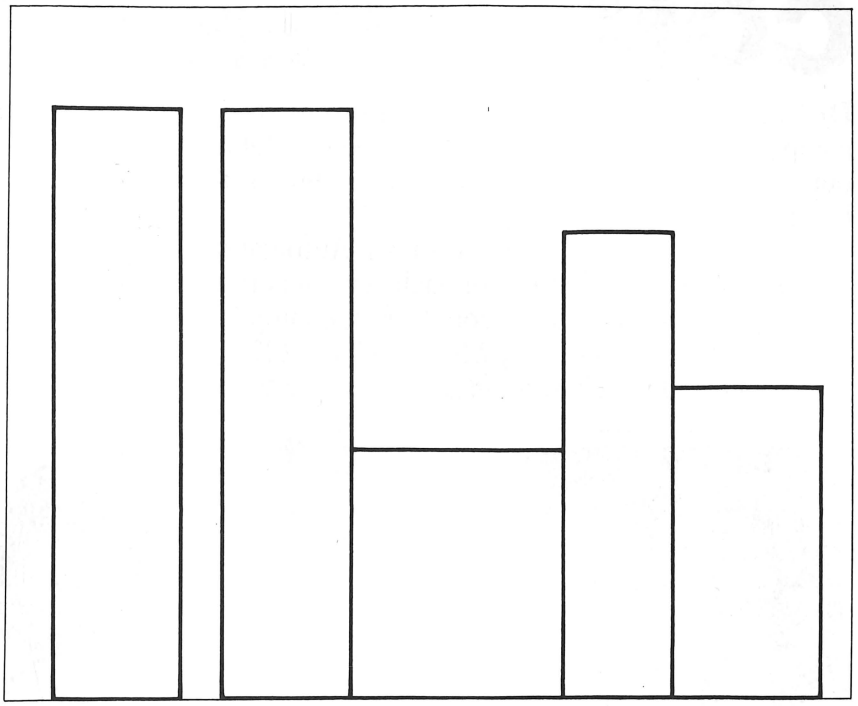


Illustration 1: The World Trade Center's twin towers and other buildings make up a Logo city block.

What To Do

1. Boot Logo into your computer. (The program will work for almost all versions of Logo.)

2. Enter these procedures exactly as they appear.

```
TO BASE :H :W
  REPEAT 2 [RT 90 FD :W RT 90
FD :H]
END

TO ROOF :W
  RT 30 FD :W RT 120 FD :W
  SETH 0
END
```

3. Type BASE 30 30 and press RETURN or ENTER to see the base of the building.

4. Type ROOF 30 and press RETURN or ENTER to see the roof.

5. Clear the screen. Make a bigger base by typing BASE 60 50. Add a roof by typing ROOF 50.

City Building Challenges

Try these Logo programming challenges. If you do them all, take the City Block Superchallenge!

- Find New York City's two World Trade Center towers in Illustration 1. Use the BASE procedure to draw them. The towers should be exactly the same size — *very* tall!
- Make a chain of square stores without roofs. The stores can be big, small, or medium-size.

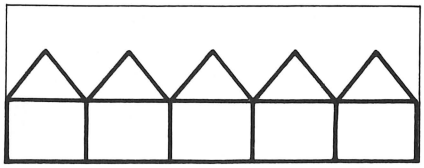


Illustration 2: Can you use the BASE *and* ROOF *procedures to make a row of houses like these?*

- Use BASE and ROOF to make a row of houses that look alike. How many can you fit on the screen without overlapping? (See Illustration 2.)
- Make a city block with tall and short buildings. Put roofs on the short buildings, but not on the tall ones.
- Create two new procedures called ROOF2 and ROOF3 that draw fancy roofs. Use these and the BASE and ROOF procedures to make a city block. The block can have apartments, offices, warehouses, stores, or townhouses.

City Block Superchallenge

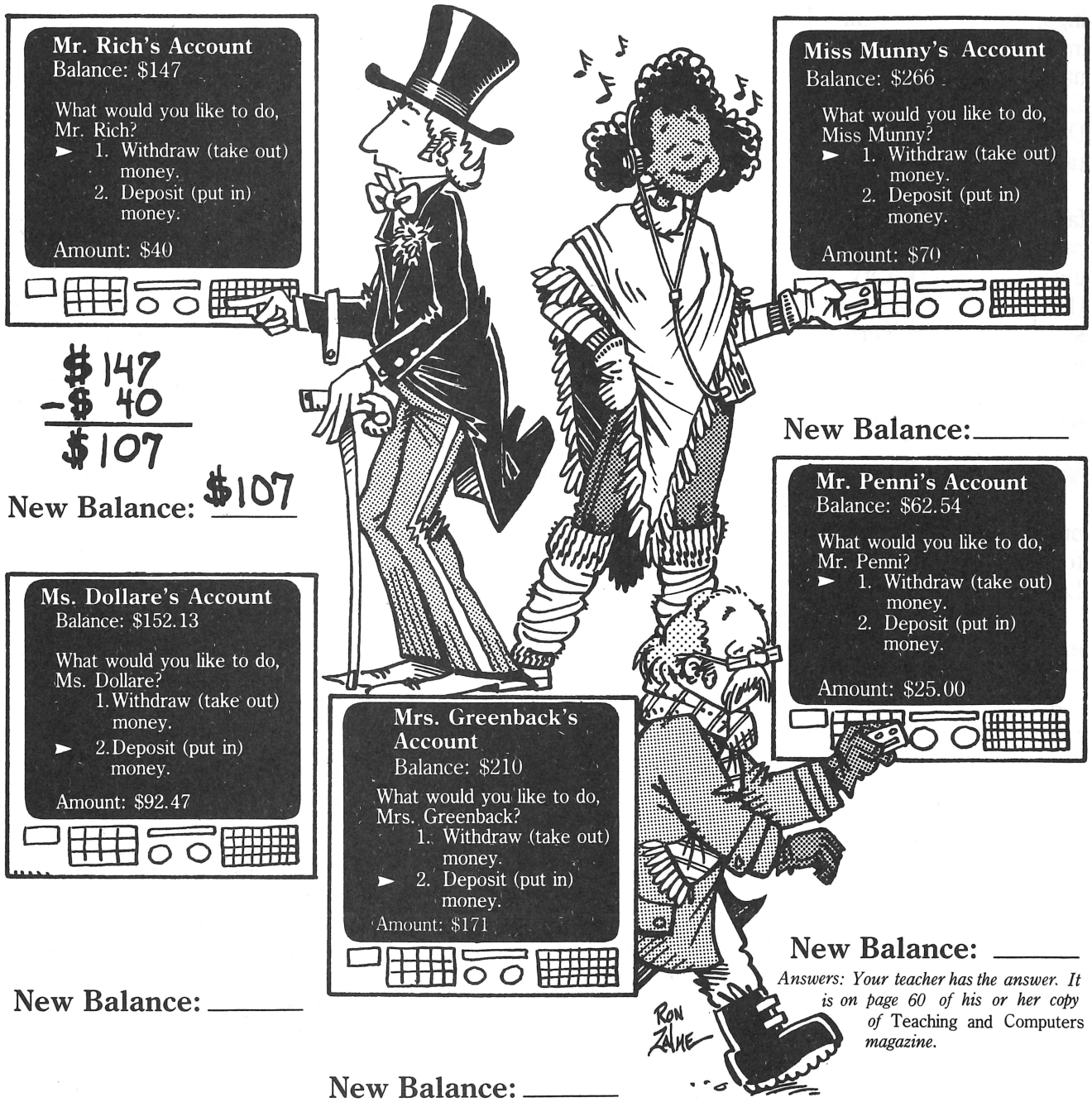
Use the RANDOM command in a new procedure called SKYLINE. The SKYLINE procedure should draw buildings of random (varied) size with or without roofs. It's okay for the buildings to overlap.

COMPUTER BANKING

Directions: An Automatic Teller Machine is a computer used for banking. It lets people take out and put in money without the help of a human bank teller.

Below are five screens from an Automatic Teller Machine. At the top of each screen is the amount of money in an account. For example, the first screen shows that Mr. Rich has $147 in his account. On each screen, an arrow points to the task that the account holder wants the computer to do. For example, Mr. Rich wants the computer to withdraw (take out) money. The amount to take out or put in is always shown on the bottom of the screen.

For each screen, do the bank task the account holder wants the computer to do. Write the person's new balance in the blank. (Show your math.) The first one is done for you.



Answers: Your teacher has the answer. It is on page 60 of his or her copy of Teaching and Computers *magazine.*

COPY

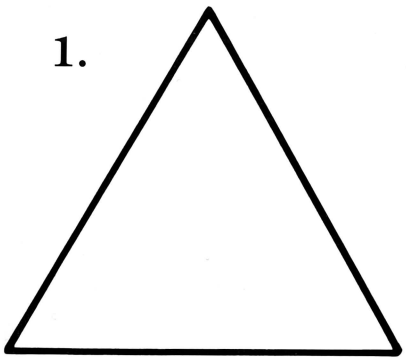
PRIMARY

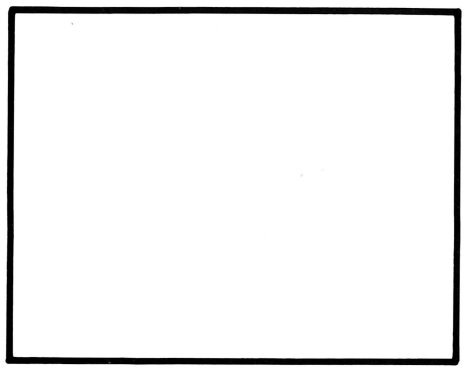
WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

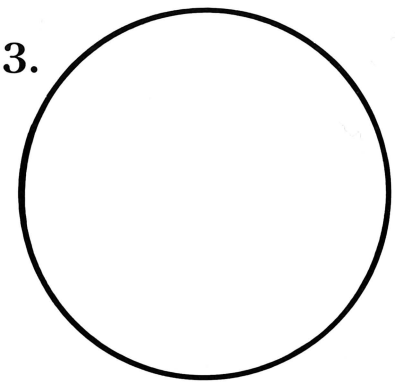
NAME: _____

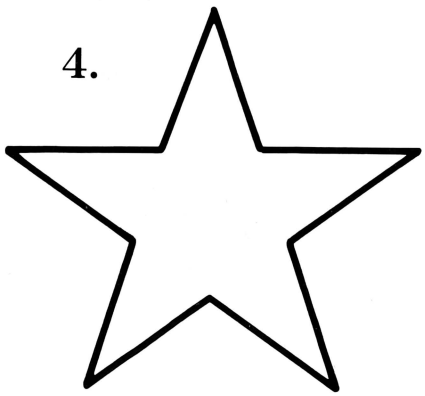
COLOR THE POLYGONS

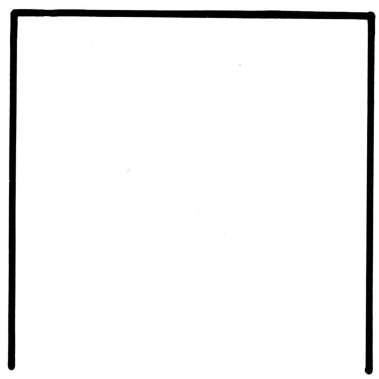
A *polygon* is a closed shape with straight sides. Color all the polygons below.

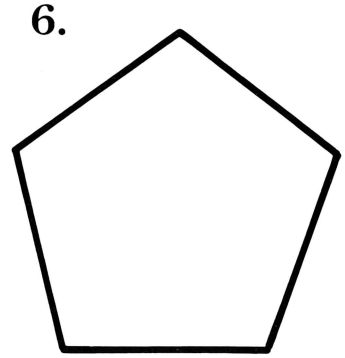
1. 

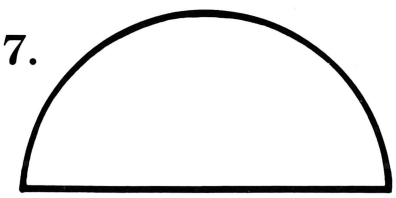
2. 

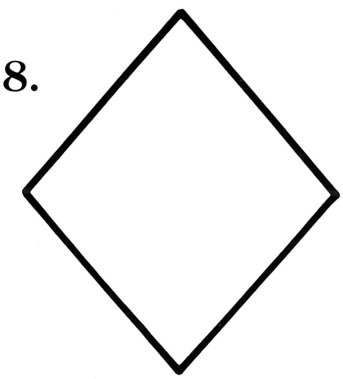
3. 

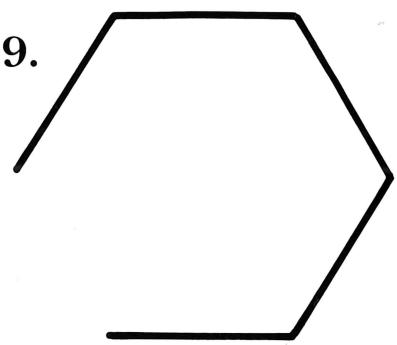
4. 

5. 

6. 

7. 

8. 

9. 

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COPY

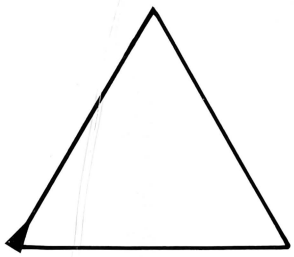
PRIMARY

WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

NAME: _____

MAKE LOGO POLYGONS

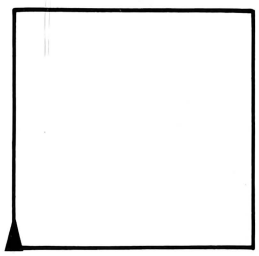
Write the name of each polygon in the blank next to it. After you fill in the blanks, you will have a Logo procedure for each polygon. Boot Logo into your computer. Then type the procedures into your computer to see the polygons.



1. TO _____

REPEAT 3 [FORWARD 50 RIGHT 120]

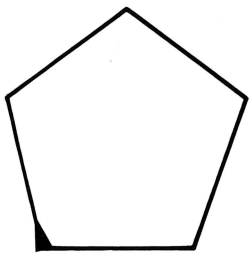
END



2. TO _____

REPEAT 5 [FORWARD 30 RIGHT 72]

END



3. TO _____

REPEAT 4 [FORWARD 50 RIGHT 90]

END

WORD LIST

PENTAGON
TRIANGLE
SQUARE

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COPY

INTERMEDIATE

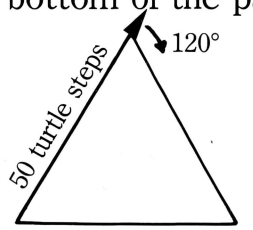
WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

NAME: _____ PART 1

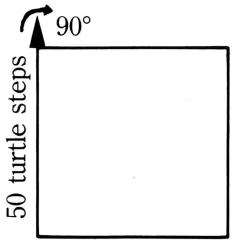
THE RULE OF 360

The Rule of 360 is a special rule that can help you make any kind of regular polygon on the Logo screen.

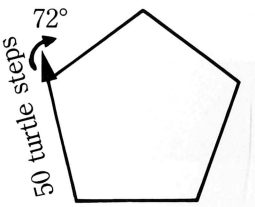
See if you can guess what the rule is. Follow these steps: (1) Look at the procedures to draw a triangle, square, and pentagon below; (2) answer the questions; then (3) fill in the blanks to The Rule of 360 that is written at the bottom of the page.



TO TRIANGLE
REPEAT 3 [FORWARD 50 RIGHT 120]
END



TO SQUARE
REPEAT 4 [FORWARD 50 RIGHT 120]
END



TO PENTAGON
REPEAT 5 [FORWARD 50 RIGHT 72]
END

1.(a) In the TRIANGLE procedure, how many times does the turtle repeat the commands in brackets? _____

(b) In the SQUARE procedure, how many times does the turtle repeat the commands? _____

(c) In the PENTAGON procedure, how many times does the turtle repeat the commands? _____

2.(a) In the TRIANGLE procedure, how many degrees to the right does the turtle turn at each corner? _____

(b) What is the *total* number of degrees the turtle turns to make a triangle? (Hint: The turtle makes 3 turns.) _____

(c) What is the *total* number of degrees the turtle turns to make a square? _____

(d) What is the *total* number of degrees the turtle turns to make a pentagon? _____

3. Now see if you can complete The Rule of 360 in the box below.

THE RULE OF 360

To use the Rule of 360, first count the number of sides in the polygon. This number equals the number of times the turtle _____ the commands in brackets.

Next, divide the number of sides into _____, or the total number of degrees the turtle turns to make a polygon. That will give you the number of degrees the turtle turns right at each corner.

The distance the turtle travels forward changes the size of the polygon, but not the _____ of the polygon.

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INTERMEDIATE

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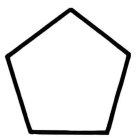
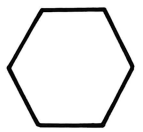
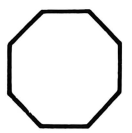
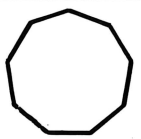
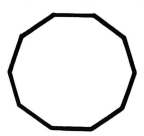
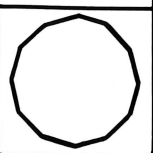
NAME: _____

PART 2

THE RULE OF 360

You can use the rule of 360 to make hexagons, octagons, and other regular polygons. This chart will help you. Fill in the missing blanks.

Name of Polygon	Shape	Number of Sides	Number of REPEATs	Degrees to Turn	Logo Procedure
Pentagon		5	5	360/5 = 72	REPEAT 5 [FD 50 RT 72]
Hexagon					
Octagon					
Nonagon					
Decagon					
Dodecagon					

Challenge: Use the Rule of 360 to make a circle on your Logo screen.

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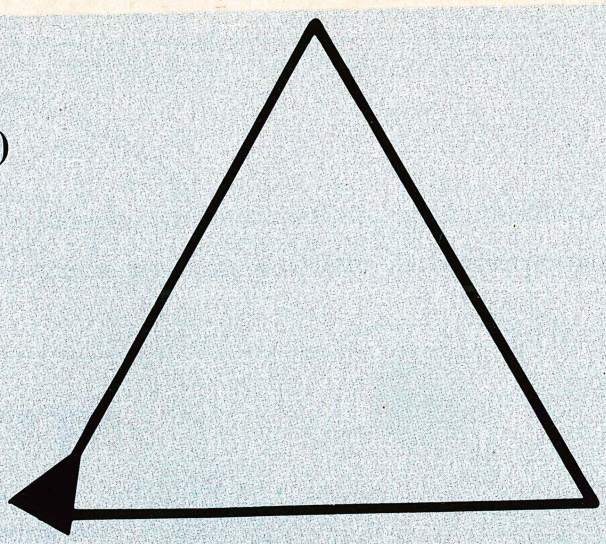
TRIANGLE
(Three-Sided Polygon)



Use this Logo procedure:

```
TO TRIANGLE
  REPEAT 3 [FORWARD 50 RIGHT 120]
END
```

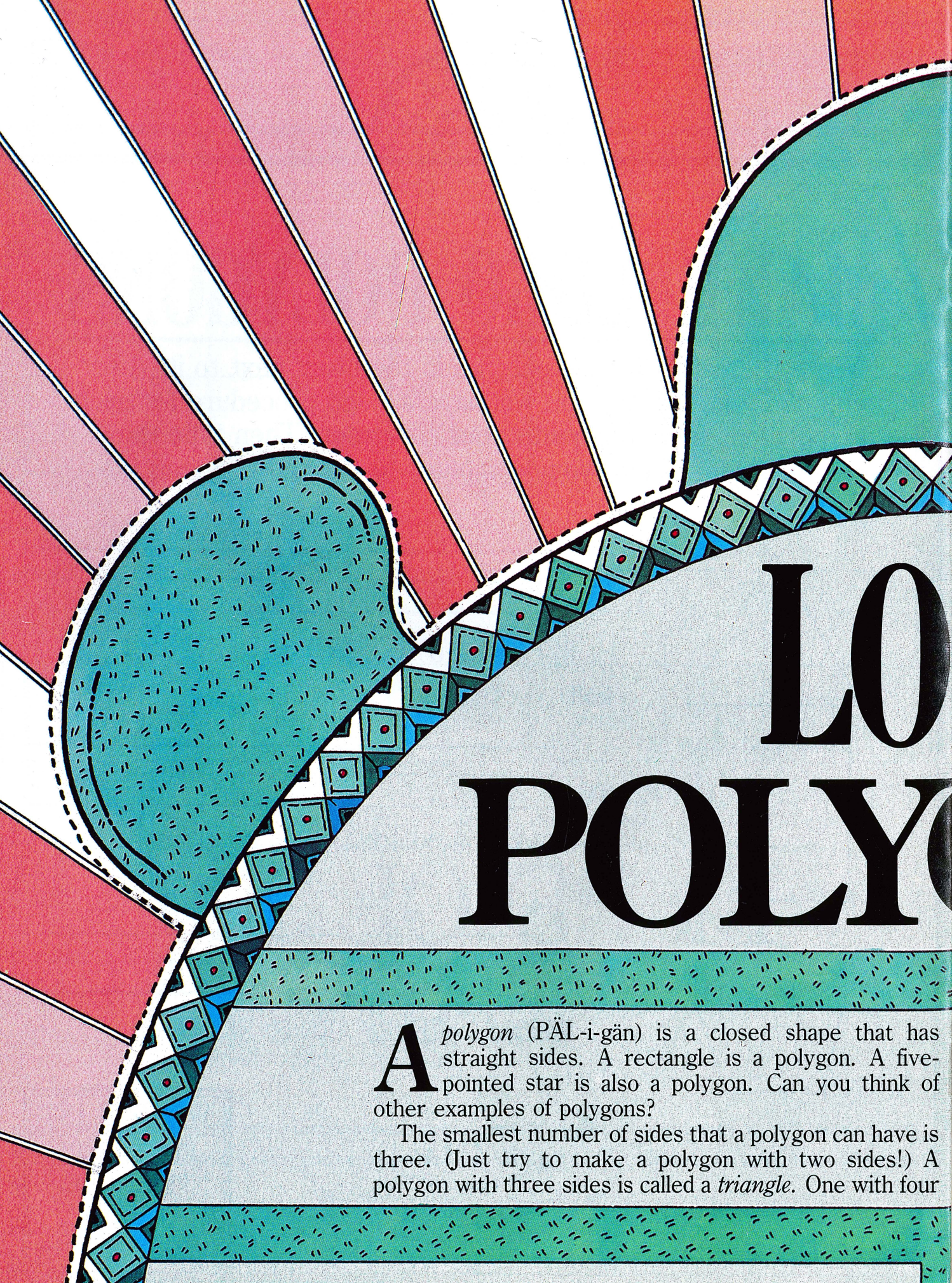
MO
POLY

SQUARE
(Four-Sided Polygon)

```
TO SQUARE
  REPEAT 4 [FORWARD
50 RIGHT 90]
END
```

PEN
(Fiv
Po

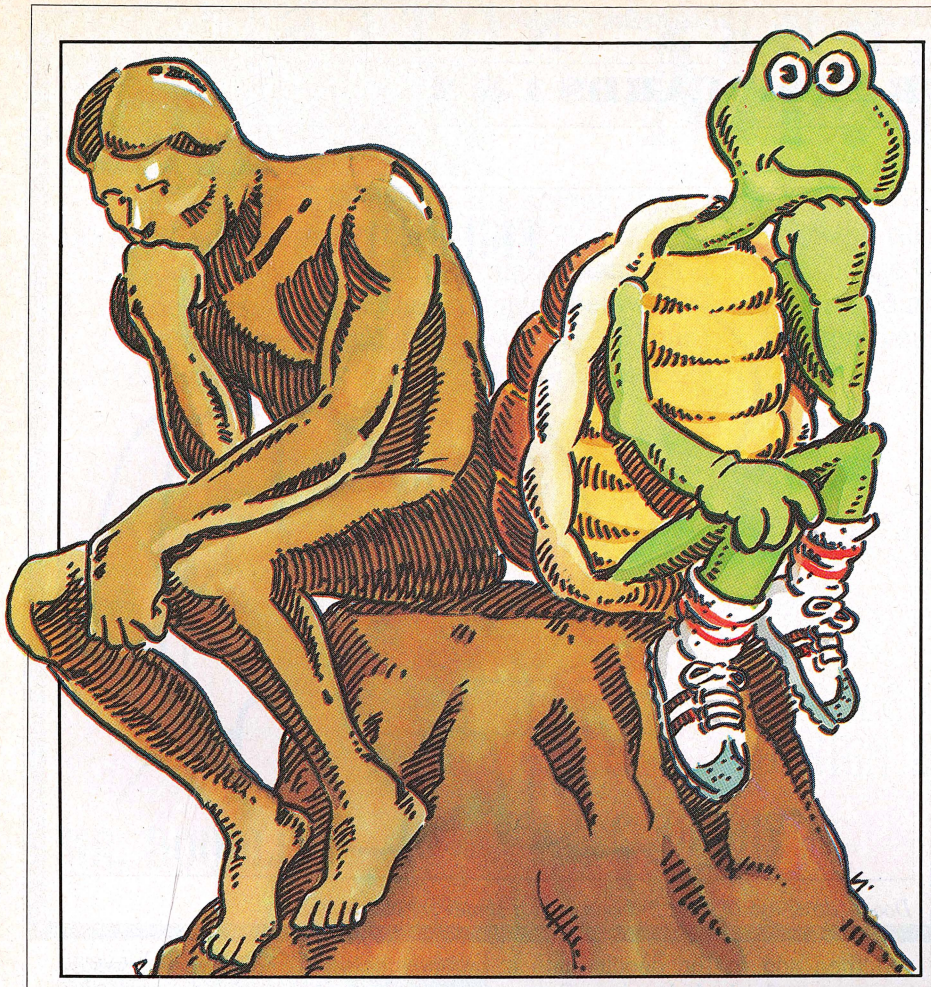
```
TO PI
  REI
50 RI
END
```



LO
POLY

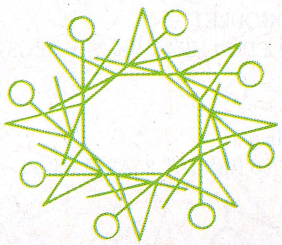
A *polygon* (PÄL-i-gän) is a closed shape that has straight sides. A rectangle is a polygon. A five-pointed star is also a polygon. Can you think of other examples of polygons?

The smallest number of sides that a polygon can have is three. (Just try to make a polygon with two sides!) A polygon with three sides is called a *triangle.* One with four



Phillip Scheuer

HOW TO USE DESIGNS AND DOODLES TO DEVELOP PROBLEM SOLVING SKILLS



BY EVELYN DALE

THINKING WITH LOGO

Today's students need to learn *how* to solve a problem. The best way to teach children *how* to problem solve is to provide them with experiences in different kinds of thinking. In this Logo teaching unit, children are introduced to two kinds of thinking skills.

In the first set of activities, children use *inductive thinking* skills: they learn to solve a problem by taking part of the problem and expanding upon or exploring it until possible solutions evolve. This type of thinking is akin to the inventor's tinkering and encourages students to approach problems creatively. In this unit, children use inductive thinking to turn Logo doodles into complete drawings.

In the second part of the unit, children use *deductive thinking* skills. Deductive thinking involves breaking down a problem into smaller parts. In this feature, students break down complex designs into *modules* (shapes that make up the design). For each design, they write Logo procedures to draw the modules and then assemble these procedures into a new procedure that draws the entire design.

All of the activities in this teaching unit are presented on task cards that students complete individually. The teacher's notes on pages 38 and 40 provide learning objectives, Logo prerequisites, and instructions for preparing and implementing the activities.

The activities can be used with most versions of Logo. *(continued)*

TEACHERS' NOTES
FOR TASK CARDS 1 & 2

DOODLE DRAWINGS

Objective: In these activities, students use inductive thinking skills to turn simple doodles into complete drawings.

Logo Prerequisites: Students should be familiar with the following Logo commands: FD, BK, RT, LT, PU, PD, CS or DRAW, REPEAT, and SAVE. They should also know how to define procedures.

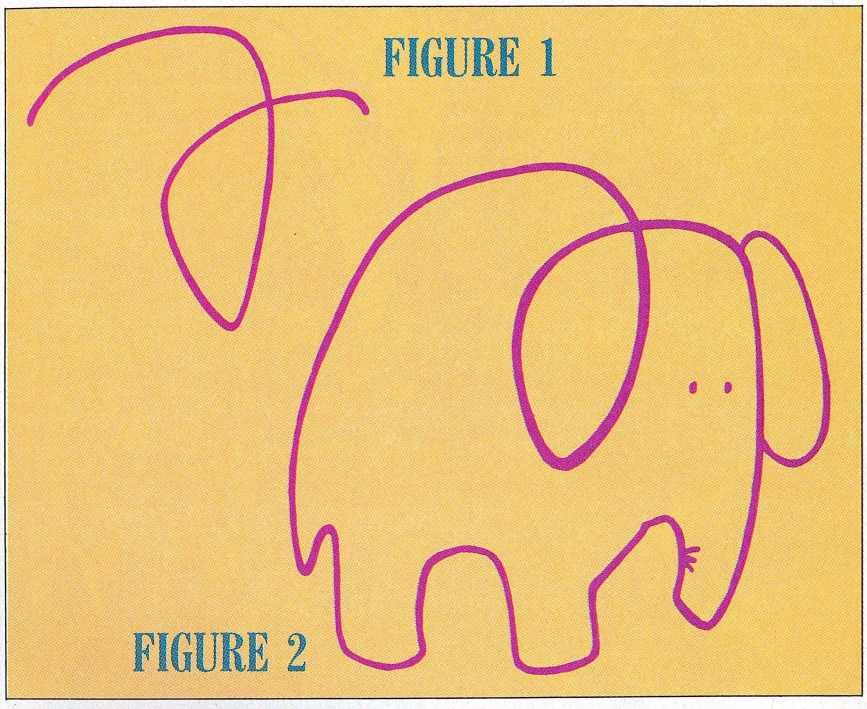
Preparation: Load Logo into your computer and enter the following procedures. Save them under the file name DOODLE.

```
TO DOODLE1
  HT FD 30 HEAD BK 25 V LEGS
END

TO HEAD
  LT 90 REPEAT 2 [ARC] RT 90
END

TO ARC
  REPEAT 18 [RT 5 FD 1 RT 5]
END

TO LEGS
  LT 150 FD 25 V
END

TO V
  RT 30 FD 20 BK 20 LT 60 FD 20 BK 20
END

TO DOODLE2
  FD 50 RT 135 FD 30 RT 135 FD 50
END
```

Cut out Task Cards 1 and 2 (on the opposite page) and laminate them.

Activity: Begin a class discussion about inductive thinking by explaining that sometimes you know the answer or *solution* to a problem right away and sometimes you don't. When you don't know what the solution should be right away, you can use *inductive thinking* to solve the problem. Inductive thinking means that you start with something that you know about the problem and expand on it until you come up with some possible solutions.

For example, sometimes artists use inductive thinking to decide what to draw. They start by drawing any scribble or doodle that comes to mind and then add to the doodle until it becomes a finished drawing. Sometimes artists will make many different drawings based on one doodle. Explain that this is because, as artists draw, their ideas often change. They might stop in the middle of one picture to start a new one.



Doodle drawings (Figure 2) begin with a simple scribble.

Tell students that as a class, they are going to create a drawing out of a doodle. First, make a random doodle on the board such as the one in the illustration on this page. Next, ask students to think of ways to turn the doodle into a finished picture by adding lines. Write a list of possibilities on the board. Choose one idea from the list and finish the drawing (see illustration). Ask kids if the drawing is finished. Does anyone have ideas on how they could add to it? (Lead students to understand that there are an infinite number of additions they could make to any drawing.)

Point to the list of ideas on the board and explain that, by starting with one single doodle and coming up with a list of many possible drawings, students used inductive thinking skills.

Load the *Doodle* procedures and run DOODLE1. (Type DOODLE1 and press RETURN or ENTER.) Tell everyone to look at the stick figure on the screen and think of designs, patterns, or other pictures that they could make from it. For example, they could make a row of stick figures across the screen. Have students write all their ideas on paper.

Instruct children to complete Task Cards 1 and 2 individually. In Task Card 1, students write procedures to draw three different designs, all based on the stick figure. (Tell them they can use their list of picture ideas to get started.) In Task Card 2, students write procedures to draw five designs based on a single abstract screen doodle.

If your Logo system has printing capabilities, print out students' pictures from one of the task card activities. Tack the original doodle in the center of a bulletin board and arrange students' finished drawings around it.

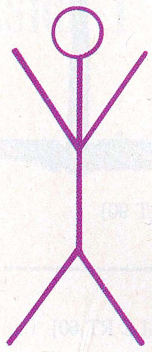
Extension: Challenge students to write other Logo procedures that draw screen doodles. Add the procedures to the DOODLE file and have children work in teams of two or three to turn the doodles into completed drawings.

(continued)

LOGO TASK CARD 1

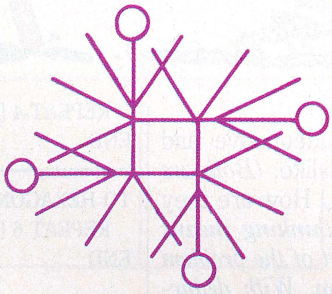
Mr. Doodle

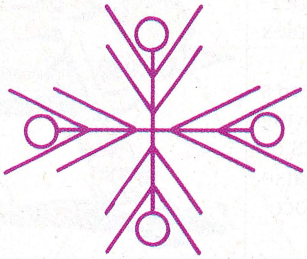
1. To see Mr. Doodle on the screen, type DOODLE1 and press RETURN or ENTER.
2. You can use DOODLE1 to make many different designs. Look at the examples below.
3. On the screen, draw at least three of your own designs by using only the DOODLE1 procedure. (You can use PENUP and PENDOWN to change the turtle's position, if you like.)
4. Choose the design you like the best. Create a procedure to make it.
5. Save your procedure on disk or cassette.



MR. DOODLE

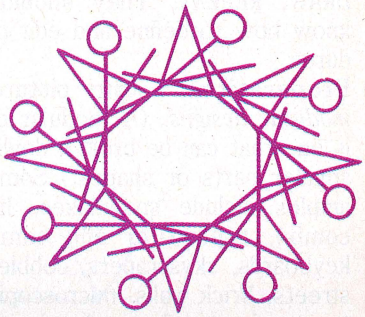
DOODLE DESIGN 1





DOODLE DESIGN 2

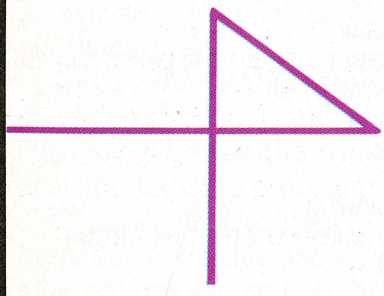
DOODLE DESIGN 3



LOGO TASK CARD 2

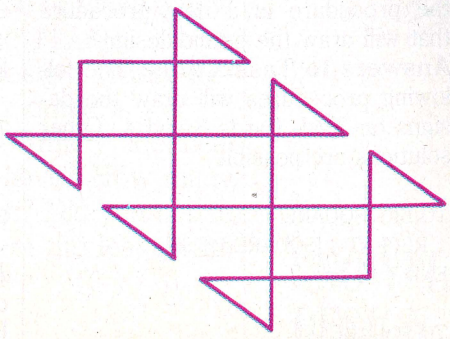
Doodledy Do

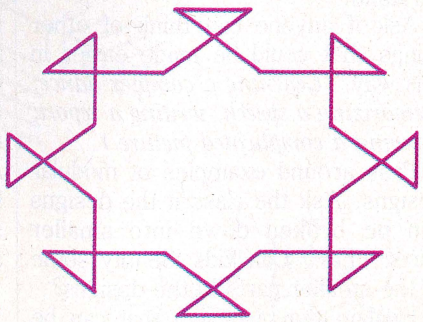
1. To see the Doodledy Do design on the screen, type DOODLE2 and press RETURN or ENTER.
2. You can use DOODLE2 to make many different patterns. For ideas, look at the examples below.
3. On the screen, draw at least five patterns of your own by using only the DOODLE2 procedure. (You can put the turtle in different positions by using PENUP and PENDOWN commands, if you like.)
4. Choose the design you like the best. Create a procedure to draw it.
5. Save your procedure on disk or cassette.



DOODLEDY DO DESIGN

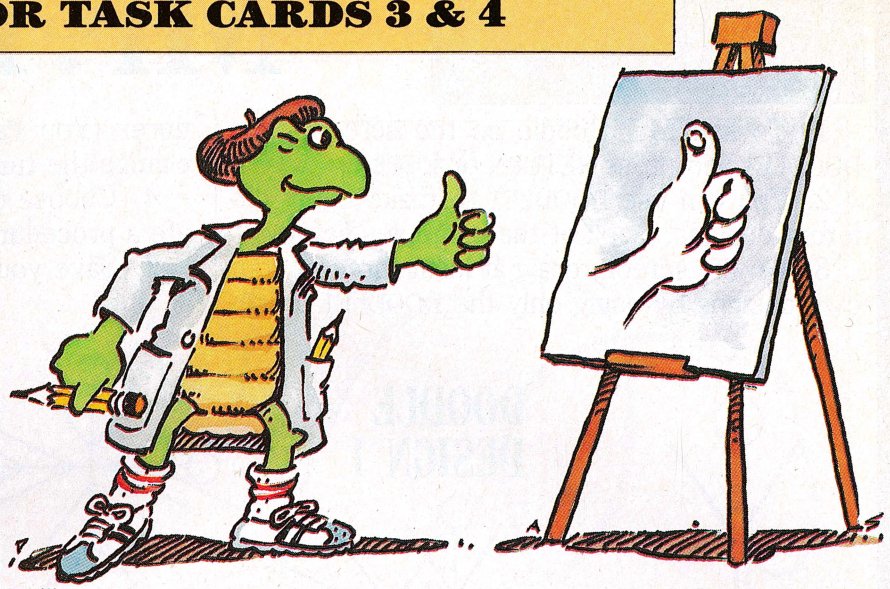
DOODLE DESIGN 1





DOODLE DESIGN 2

TEACHERS' NOTES
FOR TASK CARDS 3 & 4



MODULAR DESIGNS

Objective: After completing Task Cards 3 and 4, students will have used deductive thinking skills to (1) divide a complex design into simple shapes, (2) write Logo procedures to draw the simple shapes, and (3) combine these procedures into a super-procedure that draws the complex design.

Logo Prerequisites: Students should be familiar with the following Logo commands: FD, BK, LT, RT, CS or DRAW, REPEAT. They should also know how to define and edit procedures.

Preparation: Locate pictures of *modular designs*. (A modular design is one that can be broken down into smaller parts or shapes.) Some examples include snowflakes, honeycombs, typewriter and computer keyboards, skyscrapers, cobblestone streets, brick walls, microscopic pictures of crystals, and microscopic pictures of cells. Also locate a lengthy book that is divided into chapters (any title will do).

Cut out Task Cards 3 and 4 (on the opposite page) and laminate them.

Activity: Begin a discussion about deductive thinking by holding up a lengthy book and asking kids if they would want to learn about all the information in it. Explain that, although the book contains a lot of material, it is easier to take in than they may think. That's because the author has divided the information into "bite-size chunks," or chapters. Dividing something big and complex into smaller parts often can make it easier to understand.

Ask if anyone can think of other things that could be made easier in this way. *(Learning a complex dance, memorizing a speech, writing a report, drawing a complicated picture.)*

Pass around examples of modular designs. Ask the class if the designs can be broken down into smaller parts. *(Yes.)* Can kids identify some of the smaller parts in the designs?

Explain that a design that can be broken down into parts (modules) is called a *modular design*. The process of breaking down the designs requires the use of deductive thinking skills.

Ask students how deductive and inductive thinking are alike. *(Both are used to solve problems.)* How are they different? *(Inductive thinking means that you start with part of the problem and build to a solution. With deductive thinking, you solve a problem by breaking it down into smaller parts.)*

Tell students that they will use deductive thinking skills to draw designs on the Logo screen. Have them complete Task Cards 3 and 4 independently.

Task Card 3 displays two simple geometric designs — a square made up of four smaller squares and a hexagon made up of six equilateral triangles. Students write a procedure to draw the basic modular unit of each design (a square for the first design and a triangle for the second design). They then use each procedure in a new procedure that will construct its entire design.

Task Card 4 displays two modular snowflake designs. For each design, students break down the snowflake into six similar parts, write a procedure to draw the part, and then use the procedure in a new procedure that will draw the entire design.

Answers to Task Cards: The following procedures will draw the designs on Task Cards 3 and 4. Other solutions are possible.

```
TO BIG.SQUARE
  REPEAT 4 [SQUARE RT 90]
END

TO SQUARE
  REPEAT 4 [FD 50 RT 90]
END
```

```
TO HEXAGON
  REPEAT 6 [TRIANGLE RT 60]
END

TO TRIANGLE
  REPEAT 3 [FD 50 RT 120]
END
```

```
TO FLAKE1
  REPEAT 6 [BRANCH RT 60]
END

TO BRANCH
  FD 15 REPEAT 6 [FD 10 V] BK 75
END

TO V
  RT 60 FD 22 BK 22
  LT 120 FD 22 BK 22 RT 60
END
```

```
TO FLAKE2
  REPEAT 6 [LEAF RT 60]
END

TO LEAF
  REPEAT 3 [FD 20 RT 60 CRYSTAL LT 120
CRYSTAL RT 60]
  BK 60
END

TO CRYSTAL
  FD 20 REPEAT 6 [FD 7 BK 7 RT 60]
  BK 60
END
```

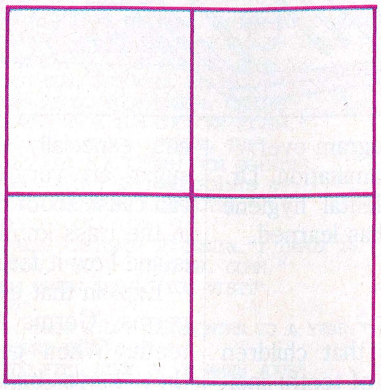
Evelyn Dale is a Logo teacher and consultant in the Sacramento – San Francisco, California, area.

LOGO TASK CARD 3

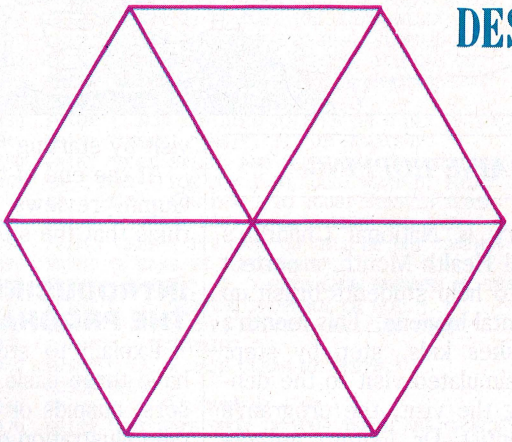
Simple Designs

1. Look at Design 1. It is made up of four squares. Write a procedure called SQUARE to draw one of these squares.
2. Use your SQUARE procedure in a new procedure that will draw all of Design 1.
3. Look at Design 2. What is the *one* basic shape in this design? Write a procedure to draw this shape.
4. Use the procedure in a new procedure that will draw all of Design 2.
5. Save your programs for Design 1 and Design 2 on disk or cassette.

DESIGN 1



DESIGN 2

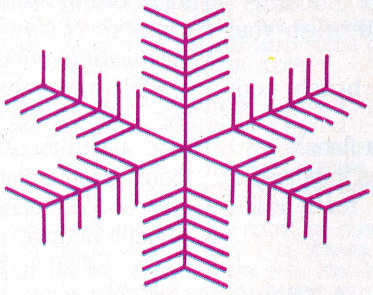


LOGO TASK CARD 4

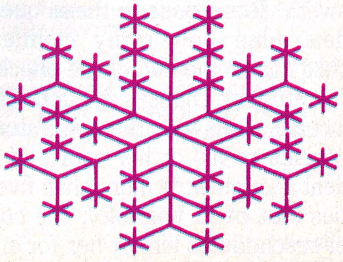
Super Snowflakes

1. Look at Design 1. This snowflake has six *identical* branches (branches that are the same). Each branch has six identical v-shaped "leaves."
2. Write a procedure called LEAF that draws one of these v-shaped leaves.
3. Use the LEAF procedure to make a new procedure called BRANCH. The BRANCH procedure should draw one of the six branches of the snowflake. (Hint: Repeat the LEAF procedure six times.)
4. Use the BRANCH procedure to make a new procedure called FLAKE1. The FLAKE1 procedure should draw the whole design. (Hint: Repeat the BRANCH procedure six times.)
5. Look at Design 2. How many identical branches does this snowflake have? How many identical tips are on each branch? Did you notice that all the crystals at the end of the leaves are also identical?
6. Write a Logo program to draw Design 2.
7. Save your programs for Design 1 and Design 2 on disk or cassette.

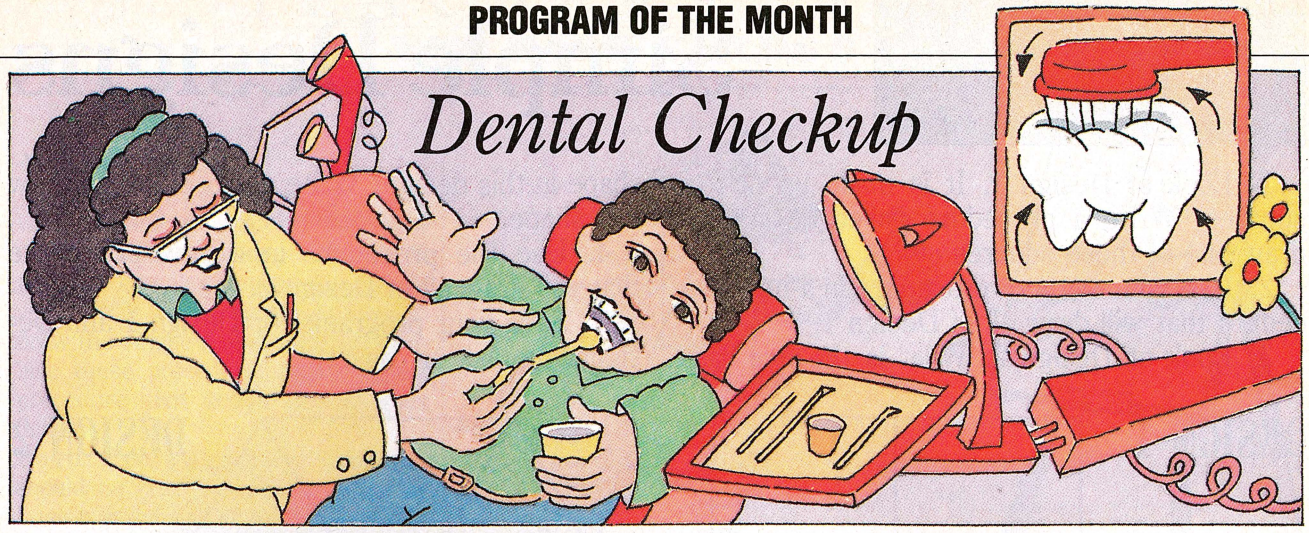
SNOWFLAKE DESIGN 1



SNOWFLAKE DESIGN 2



Dental Checkup



BY LORRAINE HOPPING

February is National Children's Dental Health Month, a perfect time to help students brush up on dental hygiene. This month's program takes kids, step by step, through a simulated visit to the dentist. During the visit, the program's resident dentist, Dr. Gumm, quizzes students about brushing, flossing, and other dental hygiene practices.

HOW THE PROGRAM WORKS

In the program, Dr. Gumm performs a make-believe dental examination in which she takes an X-ray, cleans the student's teeth, and fills any cavities that she finds.

During the examination, Dr. Gumm asks seven dental hygiene questions. Here are the questions:

- How often should you visit the dentist?
- How often should you brush your teeth?
- Describe how you brush your teeth.
- How often should you floss?
- Why are dental X-rays important?
- What are your front teeth called and what do they do?
- How do cavities form?

For each question, a student chooses one of three possible answers. Responses to these questions determine how many cavities the child has at the end of the checkup. If the student chooses an unhealthy or incorrect answer, the computer adds cavities to his or her score. If a student accumulates more than five cavities (out of 11 possible), the computer reschedules him or her for another visit by starting the program over.

At the end of the examination, Dr. Gumm reviews the dental hygiene rules that the student has learned.

INTRODUCING THE PROGRAM

Explain to students that children have three basic kinds of teeth: incisors, cuspids or canines, and molars (see illustration on page 44).

Point out that the incisors, or the four front teeth on top and four front teeth on bottom, are very sharp. They can cut easily into food. Beavers have very long incisors so that they can bite into wood. What other animals have long incisors? *(Squirrels, rats, mice, and other rodents.)*

Cuspids, or canine teeth, are the four pointy teeth on either side of the top and bottom incisors. They tear tough foods, such as meats. Dogs have long canine teeth. Can students think of any other animals with long canines? *(Lions, sharks, and other meat-eating animals.)*

Molars are the eight flat teeth in the back of the mouth. They grind food into bits. Animals that eat soft foods, such as hippopotamuses, have a lot of flat, round molars.

Adult humans have a fourth type of tooth, called a bicuspid. There are eight bicuspids, two behind each canine tooth. Most adults also have four special molars called wisdom teeth. Wisdom teeth usually grow in the back corners of the mouth when a person is about 20 years old.

Ask students how having so many different kinds of teeth is helpful to humans. *(They can eat many different foods.)*

Explain that some foods humans eat, especially those with a lot of sugar, are very bad for teeth. They can cause tooth decay. Ask if anyone in the class knows what tooth decay is and how it forms.

Explain that everyone's mouth has germs. Germs eat food that is on teeth. When germs eat the food, they leave behind a very strong chemical called an *acid*. The acid wears down the outer layer of the tooth (the *enamel*). This wearing down is called tooth decay. (*Dental caries* is another term for tooth decay.)

Tooth decay can make a cavity, or hole, in the tooth. If the cavity is not filled, the hole gets deeper. If the decay reaches the center of the tooth, the tooth can die.

Brushing and flossing keeps food from building up on teeth. Without food, germs cannot produce the acid that causes tooth decay.

USING THE PROGRAM

Type in and save the *Dental Checkup* program listed on page 43. Have students run through the program individually.

Challenge programmers in the class to add special effects to *Dental Checkup*, such as tooth-cleaning noises and X-ray flashes.

For more information on dental hygiene, write to the American Dental Association (sponsors of National Children's Dental Health Month), Bureau of Health Education and Audiovisual Services, 211 E. Chicago Ave., Chicago, IL 60611.

Lorraine Hopping is associate editor for *Teaching and Computers*.

(continued)

Michael Donato

PROGRAM LISTING FOR *DENTAL CHECKUP*

This program listing is for Apple computers. To convert the program for use on Atari, Commodore 64, Radio Shack Color Computer, and TRS-80 Model III computers, see the Conversion Chart on page 60.

```
10  REM   DENTAL CHECKUP @1986 SCHOLASTIC INC.
20  HOME : CLEAR
30  PRINT "      ***************************"
40  PRINT "      *   DR. GUMM'S OFFICE     *"
50  PRINT "      ***************************"
60  PRINT : PRINT "  PLEASE HAVE A SEAT. DR. GUMM WILL BE"
70  PRINT "WITH YOU SHORTLY."
80  PRINT : PRINT "  WHILE YOU'RE WAITING, ENTER YOUR NAME"
90  PRINT "INTO THE COMPUTER AND PRESS <RETURN>.": INPUT N$
100  PRINT : PRINT "  THANK YOU, ";N$;". DR. GUMM IS"
110  PRINT "READY FOR YOU NOW. SHE WILL ASK YOU A"
120  PRINT "FEW QUESTIONS ABOUT YOUR TEETH. CHOOSE"
130  PRINT "THE BEST ANSWER FROM THE CHOICES GIVEN."
140  PRINT "  IF YOU CHOOSE A WRONG ANSWER, THE"
150  PRINT "COMPUTER WILL ADD 'CAVITIES', OR POINTS"
160  PRINT "TO YOUR SCORE. AVOID GETTING POINTS BY"
170  PRINT "ANSWERING THE QUESTIONS CORRECTLY."
180  PRINT : PRINT "  GOOD LUCK, ";N$;"!"
190  PRINT : PRINT "  PRESS <RETURN> TO BEGIN.": INPUT Z$
200  HOME : PRINT "  HELLO, ";N$;"! I'M DR. GUMM."
210  PRINT "TELL ME, HOW OFTEN SHOULD YOU VISIT"
220  PRINT "THE DENTIST?"
230  PRINT : PRINT "  1. ONCE EVERY SIX MONTHS TO A YEAR."
240  PRINT "  2. ONCE EVERY TWO YEARS."
250  PRINT "  3. WHEN YOU FEEL LIKE IT OR WHEN YOUR"
260  PRINT "MOM OR DAD MAKES YOU."
270  GOSUB 10000
280  IF C$ = "2" THEN SC = SC + 1: REM  ADD CAVITY FOR WRONG
     ANSWER
290  IF C$ = "3" THEN SC = SC + 2
300  IF C$ <  > "1" THEN  PRINT " YOU SHOULD VISIT THE DENTIST
     EVERY": PRINT "SIX MONTHS."
310  IF C$ = "1" THEN  PRINT "  I'M GLAD YOU ARE TAKING GOOD
     CARE OF ": PRINT "YOUR TEETH, ";N$;"."
320  PRINT "  HOW OFTEN SHOULD YOU BRUSH YOUR TEETH?"
330  PRINT : PRINT "  1. ONCE A DAY."
340  PRINT "  2. TWICE OR THREE TIMES A DAY."
350  PRINT "  3. LESS THAN ONCE A DAY."
360  GOSUB 10000
370  IF C$ = "1" THEN SC = SC + 1
380  IF C$ = "3" THEN SC = SC + 2
390  IF C$ <  > "2" THEN  PRINT "  YOU SHOULD BRUSH AFTER
     EVERY MEAL,": PRINT N$;", OR THREE TIMES A DAY."
400  IF C$ = "2" THEN PRINT "  KEEP UP THE GOOD WORK, ";N$;"."
410  PRINT "  WHICH ONE OF THE FOLLOWING BEST"
420  PRINT "DESCRIBES HOW YOU SHOULD BRUSH YOUR TEETH?"
430  PRINT : PRINT "  1. BRUSH UP AND DOWN THE FRONT OF"
440  PRINT "      THE TEETH."
450  PRINT "  2. SCRUB THE TOP AND SIDES OF THE"
460  PRINT "      BACK TEETH ROUND AND ROUND."
470  PRINT "  3. DO BOTH 1 AND 2. THEN USE THE TIP"
480  PRINT "      OF THE BRUSH TO REACH BEHIND THE"
490  PRINT "      FRONT TEETH."
500  GOSUB 10000
510  IF C$ = "1" OR C$ = "2" THEN SC = SC + 1
520  PRINT "  IF YOU BRUSH ALL PARTS OF YOUR TEETH,"
530  PRINT N$;" (ANSWER #3), YOU WILL HAVE"
540  PRINT "FEWER CAVITIES. YOU WILL ALSO KEEP A"
550  PRINT "STICKY SUBSTANCE CALLED PLAQUE FROM"
560  PRINT "BUILDING UP. PLAQUE CAN HARM YOUR GUMS"
570  PRINT "AND CAUSE OTHER DENTAL PROBLEMS."
580  PRINT "  ANOTHER WAY TO WARD OFF PLAQUE AND"
590  PRINT "CAVITIES IS TO USE DENTAL FLOSS. DENTAL"
600  PRINT "FLOSS IS STRING THAT YOU RUB BETWEEN"
610  PRINT "YOUR TEETH TO REMOVE BITS OF FOOD."
620  PRINT "  HOW OFTEN SHOULD YOU FLOSS, ";N$;"?"
630  PRINT : PRINT "  1. NEVER OR NOT VERY OFTEN."
640  PRINT "  2. ONCE OR TWICE A WEEK."
650  PRINT "  3. AT LEAST ONCE A DAY."
660  GOSUB 10000
670  IF C$ = "1" THEN SC = SC + 2
680  IF C$ = "2" THEN SC = SC + 1
690  PRINT "  FLOSSING ONCE A DAY IS IMPORTANT."
700  IF C$ = "3" THEN PRINT " KEEP UP THE GOOD WORK, ";N$;"."
710  PRINT "  WHEN YOU BRUSH YOUR TEETH, WATCH FOR"
720  PRINT "BLEEDING GUMS. THAT MEANS YOU ARE NOT"
730  PRINT "FLOSSING PROPERLY OR OFTEN ENOUGH."
740  PRINT "  ANOTHER WAY TO CHECK IF YOU ARE"
750  PRINT "FLOSSING AND BRUSHING PROPERLY IS TO"
760  PRINT "USE A DISCLOSING TABLET. WHEN YOU CHEW"
770  PRINT "THE TABLET, IT COLORS THE AREAS WHERE"
780  PRINT "THERE IS PLAQUE. THE COLOR WILL"
790  PRINT "DISAPPEAR AFTER YOU HAVE FLOSSED AND"
800  PRINT "BRUSHED AWAY THE PLAQUE. YOU CAN GET"
810  PRINT "DISCLOSING TABLETS AT A DRUGSTORE OR"
820  PRINT "FROM ANY DENTIST."
830  PRINT "  NOW I'D LIKE TO TAKE AN X RAY OF YOUR"
840  PRINT "TEETH, ";N$;". SIT UP STRAIGHT, "
850  PRINT "HOLD STILL, AND PRESS THE <RETURN> KEY.": INPUT Z$
860  GR : TEXT : FOR D = 1 TO 1000: NEXT D: PRINT  CHR$ (7):
     GR : TEXT : FOR D = 1 TO 1000: NEXT D: HOME
870  PRINT "  THANK YOU, ";N$;". THAT WAS EASY,"
880  PRINT "WASN'T IT? CAN YOU TELL ME WHY TAKING"
890  PRINT "X RAYS IS IMPORTANT?"
900  PRINT : PRINT "  1. X RAYS SHOW WHETHER MY TEETH ARE"
910  PRINT "      GROWING PROPERLY OR NOT."
920  PRINT "  2. X RAYS PREVENT CAVITIES FROM"
930  PRINT "      FORMING."
940  PRINT "  3. X RAYS CLEAN MY TEETH."
950  GOSUB 10000
960  IF C$ <  > "1" THEN SC = SC + 1
970  PRINT "  X RAYS SHOW IF YOUR TEETH ARE GROWING"
980  PRINT "PROPERLY. THEY CAN'T PREVENT CAVITIES,"
990  PRINT "BUT THEY CAN SHOW IF ANY CAVITIES ARE"
1000  PRINT "HIDDEN BETWEEN YOUR TEETH."
1010  PRINT "  NOW LET'S TAKE A LOOK AT YOUR TEETH,"
1020  PRINT N$;". OPEN WIDE. WHAT ARE YOUR"
1030  PRINT "FRONT TEETH CALLED AND WHAT DO THEY DO?"
1040  PRINT : PRINT "  1. THEY ARE CANINE TEETH. THEY TEAR"
1050  PRINT "MEAT AND OTHER TOUGH FOODS."
1060  PRINT "  2. THEY ARE MOLARS. THEY GRIND FOOD."
1070  PRINT "  3. THEY ARE INCISORS. THEY CUT FOOD."
1080  GOSUB 10000
1090  IF C$ <  > "3" THEN SC = SC + 1
1100  PRINT "  INCISORS IS THE RIGHT ANSWER. CANINES"
1110  PRINT "ARE THE POINTY TEETH IN BACK OF YOUR"
1120  PRINT "INCISORS. MOLARS ARE THE FLAT TEETH IN"
1130  PRINT "BACK OF YOUR CANINES."
1140  PRINT "  LET'S SEE IF I CAN SEE ANY CAVITIES,"
1150  PRINT N$;" DO YOU KNOW HOW CAVITIES FORM?"
1160  PRINT : PRINT "  1. GERMS EAT AWAY THE ENAMEL, OR"
1170  PRINT "      OUTER LAYER OF THE TOOTH."
1180  PRINT "  2. GERMS CAUSE ACID TO FORM ON THE"
1190  PRINT "      TOOTH. THE ACID WEARS AWAY ENAMEL."
1200  PRINT "  3. EATING HARD FOODS CREATES A HOLE"
1210  PRINT "      IN THE TOOTH."
1220  GOSUB 10000
1230  IF C$ = "1" THEN SC = SC + 1
1240  IF C$ = "3" THEN SC = SC + 2
1250  PRINT "  CAVITIES ARE CAUSED BY ACID ON THE"
1260  PRINT "TOOTH. THE ACID APPEARS WHEN GERMS IN"
1270  PRINT "YOUR MOUTH EAT FOOD THAT WASN'T BRUSHED"
1280  PRINT "OR FLOSSED AWAY."
1290  PRINT "  NOW, I'M GOING TO CLEAN YOUR TEETH,"
1300  PRINT N$;". FIRST, I'LL SCRAPE OFF THE"
1310  PRINT "PLAQUE. THEN I'LL POLISH YOUR TEETH SO"
1320  PRINT "THAT THEY'RE BRIGHT WHITE."
1330  PRINT "  PRESS <RETURN> WHEN YOU ARE READY.": INPUT Z$
1340  PRINT "  HERE WE GO....": FOR D = 1 TO 4000: NEXT D
1350  HOME : PRINT "  ALL DONE. ";N$;", THE X RAYS SHOW"
1360  PRINT "THAT YOU HAVE ";SC;" CAVITIES."
1370  IF SC > 5 THEN 1590
1380  IF SC = 0 THEN  PRINT "  WAY TO GO, ";N$;"! YOU ANSWERED":
     PRINT "ALL THE QUESTIONS CORRECTLY.": GOTO 1510
1390  IF SC = 1 OR SC = 2 THEN  PRINT "  THAT'S NOT TOO BAD.
     NEXT TIME, TRY TO": PRINT "ANSWER ALL THE QUESTIONS
     CORRECTLY."
1400  FOR X = 1 TO SC
```

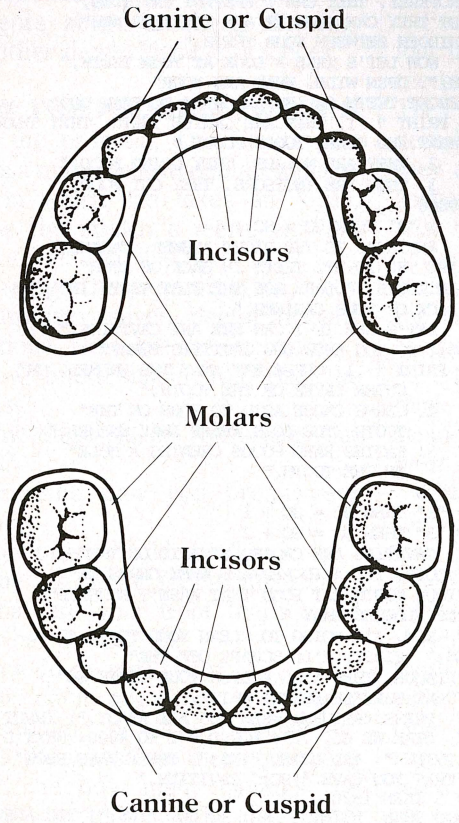
(continued)

PROGRAM LISTING FOR *DENTAL CHECKUP*

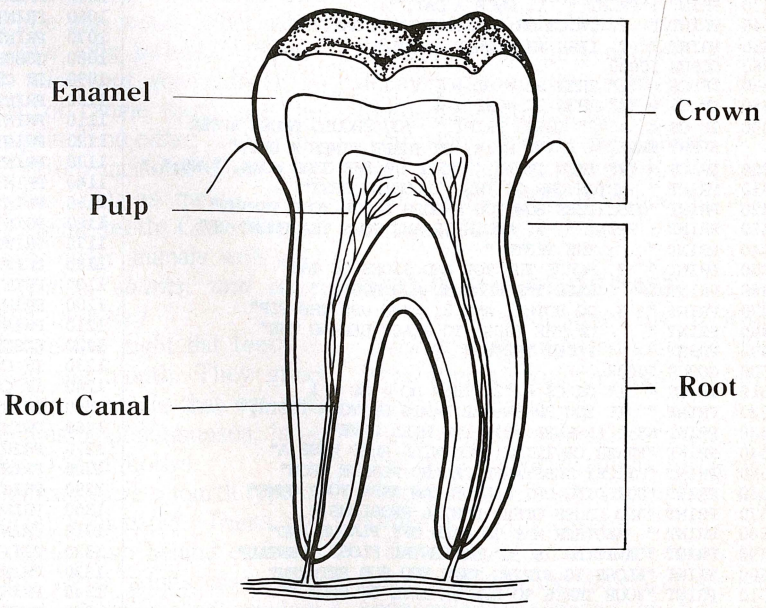
(continued from page 43)

```
1410  PRINT "  GET READY, ";N$;". I'M GOING TO"
1420  PRINT "CLEAR OUT THE DECAY WITH A DRILL...."
1430  FOR D = 1 TO 6000: NEXT D
1440  FOR D = 1 TO 5: PRINT  CHR$ (7): NEXT D
1450  PRINT "  OKAY, ";N$;", TIME FOR THE FILLING."
1460  FOR D = 1 TO 4000: NEXT D
1470  PRINT : PRINT "  I FILLED THE CAVITY WITH SILVER"
1480  PRINT "AMALGAM. PRESS <RETURN> TO CONTINUE."
1490  INPUT Z$: HOME
1500  NEXT X
1510  PRINT "  THAT'S IT FOR TODAY, ";N$;"."
1520  PRINT "REMEMBER TO FOLLOW THESE IMPORTANT"
1530  PRINT "RULES FOR DENTAL HYGIENE:"
1540  PRINT : PRINT "  1. AVOID EATING SUGARY FOODS."
1550  PRINT "  2. BRUSH AFTER EVERY MEAL."
1560  PRINT "  3. FLOSS ONCE A DAY."
1570  PRINT "  4. SEE YOUR DENTIST ONCE A YEAR."
1580  PRINT : PRINT "  SEE YOU NEXT TIME, ";N$;"....": END
1590  REM  SCHEDULE ANOTHER APPOINTMENT
1600  PRINT "  ";N$;", YOU HAVE FAR TOO MANY"
1610  PRINT "CAVITIES. YOU ARE NOT TAKING PROPER"
1620  PRINT "CARE OF YOUR TEETH."
1630  PRINT "  I HAVE SCHEDULED ANOTHER APPOINTMENT"
1640  PRINT "FOR YOU TO SEE ME RIGHT AWAY."
1650  PRINT "  THIS TIME, SEE IF YOU CAN ANSWER ALL"
1660  PRINT "THE QUESTIONS PROPERLY."
1670  PRINT "  PRESS <RETURN> TO BEGIN.": INPUT Z$: GOTO 10
10000 REM  ENTER ANSWER
10010 PRINT : PRINT "  ENTER THE NUMBER OF YOUR CHOICE (1,"
10020 PRINT "2, OR 3) AND PRESS <RETURN>."
10030 INPUT C$: IF C$ <  >"1" AND C$ <  >"2" AND C$<  >"3" THEN 10030
10040 HOME : RETURN
```

PRIMARY TEETH



Children start with 20 primary teeth: eight incisors, four canines or cuspids, and eight molars.



This diagram shows the basic parts of a tooth: the enamel, pulp, root canal, and crown.

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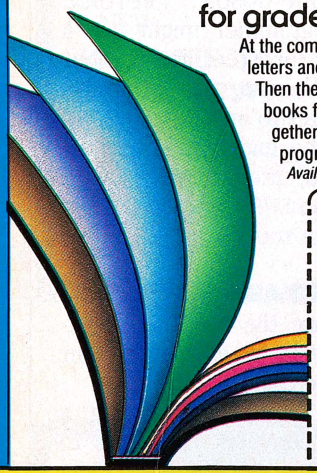

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PROGRAMMING/GOSUB

BY SANDRA MARKLE

Each month, the "BASIC Task Cards" column supplies you with four student activity cards that provide practice with BASIC programming skills. Accompanying the cards is a section of teachers' notes that define concepts and commands introduced on the cards. The notes also supply teaching objectives and answers for the card activities.

Cut out and laminate the Beginner task cards (numbers 7 and 8) on page 47 and the Intermediate task cards (numbers 7 and 8) on page 49. Direct each student to the task cards that correspond to his or her level of programming expertise.

BEGINNER TASK CARD CONCEPTS

A program is a list of instructions that tells the computer to do a job or combination of jobs.

Here is a short program that is written in BASIC. It tells the computer how to process 2x2.

```
NEW
10 PRINT 2*2
20 END
```

In this program, NEW tells the computer to erase everything in its current memory and get ready to store the program that follows. (Because the NEW command is not part of the program, it does not require a line number.)

The sample program has two lines, 10 and 20. In a program line, the number of the line comes first, followed by a space, the BASIC command word, and whatever information and other command words the computer needs to perform the task (2*2, for example).

Line numbers are always in numerical order. Also, they are often in multiples of 10 so that additional lines can be added in the middle of the program. For example, type 15 PRINT 3*3 and press RETURN or ENTER. Then type LIST and press RETURN or ENTER. (LIST tells the computer to list all the program lines.) Line 15 has automatically been inserted between lines 10 and 20.

The END command in line 20 signals the computer to stop executing the program.

To make the computer start executing the program, type RUN and press RETURN or ENTER. (Again, RUN is not part of the program and so does not require a line number.) The computer executes the lines, one at a time, in line statement order. For this program, it first multiplies 2x2 (line 10) and displays the output, 4. Then it multiplies 3x3 (line 15) and displays 9.

To erase a line from the computer's memory, type the line number and press RETURN or ENTER. For example, type 15 and press RETURN or ENTER. List the program again. Line 15 has been erased.

INTERMEDIATE TASK CARD COMMANDS

One program can often involve several tasks. For example, a program that drills math facts might display problems, check students' answers, and calculate scores.

One way to make such programs more efficient is to combine all the commands that perform a specific task into a single block. These blocks are called *routines*. The main block is called the *main routine*. Secondary blocks are called *subroutines*.

Using the GOSUB command, the programmer can make the computer exit the main routine and go to a specific subroutine. To specify which subroutine, the programmer writes the command GOSUB and then the number of first line of the subroutine. (For example: GOSUB 2000.) The computer then executes all the commands in the subroutine until it encounters the RETURN command. RETURN tells the computer to return to the place in the main routine where it left off. (Actually, it returns to the statement following the GOSUB line that previously made it exit.)

Subroutines can be called up in this manner any number of times and at any point in the program.

When using paired GOSUB . . . RETURN commands, programmers often make liberal use of the REM statement. The REM (for "remarks") statement is used to include notes in a program listing. These notes are not displayed when the program is processed. A REM statement directly after GOSUB and its line number, or one at the beginning of a subroutine, can be used to explain what task a specific subroutine is performing. This helps readers keep track of the program's flow and helps the programmer debug the program. (See Intermediate Task Card 7 for examples.)

There are three common errors that occur with GOSUB . . . RETURN. First, the programmer might use a nonexistent or incorrect line number after GOSUB. Second, the programmer might forget to include a RETURN command at the end of the subroutine. And third, programmers might forget to put an END command at the end of the main routine.

USING THE TASK CARDS

Following are the teaching objectives and answers for each of the four BASIC task cards.

Beginner #7: Students debug a program that converts 12 inches to its equivalent in centimeters. They then write their own programs to convert other English measurements to equivalent metric units.

Answer to Activity 1:

30 centimeters

```
NEW
10 PRINT "12 INCHES ="
20 PRINT 12 * 2.5
30 PRINT "CENTIMETERS"
40 END
```

Answer to Activity 2:

1. 16.5 feet.

```
10 PRINT "5 METERS ="
20 PRINT 5 * 3.3
30 PRINT "FEET"
40 END
```

2. 18 inches.

```
10 PRINT "45 CENTIMETERS ="
20 PRINT 45 * .4
30 PRINT "INCHES"
40 END
```

3. 6.6 yards.

```
10 PRINT "6 METERS ="
20 PRINT 6 * 1.1
30 PRINT "YARDS"
40 END
```

(continued)

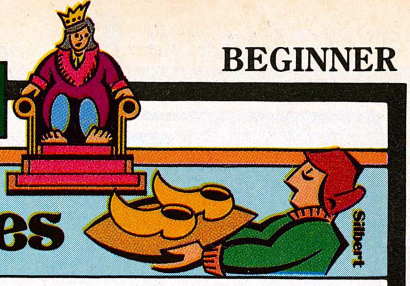
CUT OUT AND LAMINATE

BEGINNER

7

BASIC TASK CARD

The King's New Shoes



ACTIVITY 1

King Oscar wants to order a new pair of shoes. He knows his foot is 12 inches long, but the shoemaker only makes shoes in metric units. To place his order, King Oscar has to know how many centimeters long his foot is. Fortunately, he has a computer program to help him figure this out. Unfortunately, the program has five bugs in it. Find and fix the mistakes. Then enter and run the program. How many centimeters is King Oscar's foot?

```
10 NEW
PRINT "12 INCHES ="
20 12 * 2.5 PRINT
30 END
40 PRINT "CENTIMETERS"
50 RUN
```

ACTIVITY 2

Write your own programs to change each of these metric measurements into its *equivalent* (what it is equal to) in English measurements. Write the programs on a separate piece of paper. Enter and run them to make sure they work.

1. Change 5 meters to its equivalent in feet. (Hint: There are 3.3 feet to a meter.)
2. Change 45 centimeters to its equivalent in inches. (Hint: one centimeter equals .4 inches.)
3. Change 6 meters to its equivalent in yards. (Hint: There are 1.1 yards to a meter.)

ANSWERS: Check your programs with your teacher.

Bill Silbert

BEGINNER

8

BASIC TASK CARD

Recipe for a PROGRAM

ACTIVITY 1

Writing a program is like following a recipe. Below are "ingredients" for a program that figures out how many feet are in 172 inches. Use the ingredients to write the program on a separate piece of paper. Then type it into your computer and run it to make sure it works.

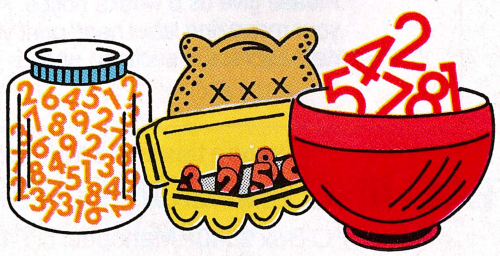
Ingredients for the Program

1. A command to erase the micro's memory.
2. A line statement to display: 174 INCHES =.
3. A line statement to display the answer to: 174/3.
4. A line statement to display: FEET.
5. A line statement to tell the computer to stop processing.

ACTIVITY 2

Write four more programs. Let each do one of the following:

1. Change 15 yards to an equivalent in inches.
2. Change 36 feet to its equivalent in yards.
3. Change 216 inches to its equivalent in yards.
4. Change 45 feet to its equivalent in inches.



ANSWERS: Check your programs with your teacher.

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BASIC CHALLENGE CARDS

(continued from page 46)

Beginner #8: Students write a program to convert inches to feet. They then modify the program to make other English measurement conversions.

Answer to Activity 1:

58 feet

```
NEW
10 PRINT "174 INCHES = "
20 PRINT 174/3
30 PRINT "FEET"
40 END
```

Answer to Activity 2:

1. 540 inches.

```
10 PRINT "15 YARDS = "
20 PRINT 15 * 36
30 PRINT "INCHES"
```

2. 12 yards.

```
10 PRINT "36 FEET = "
20 PRINT 36/3
30 PRINT "YARDS"
```

3. 6 yards.

```
10 PRINT "216 INCHES = "
20 PRINT 216/36
30 PRINT "YARDS"
```

4. 540 inches.

```
10 PRINT "45 FEET = "
20 PRINT 45 * 12
30 PRINT "INCHES"
```

Intermediate #7: Students add subroutines to complete a multiplication drill program.

Answer:

```
2000 C = N * M
2010 IF X = C THEN PRINT "CORRECT!":S = S + 1
2020 IF X<>C THEN PRINT "NO, IT'S ";C;"."
2030 RETURN
3000 PRINT "SCORE = ";S;" CORRECT OUT OF 10."
3010 RETURN
```

Intermediate #8: Students debug a program that takes a poll.

Answer: The following lines should read:

```
50 GOSUB 1000:REM GET RESPONSES TO QUESTION
130 END
1130 RETURN
```

■

Sandra Markle is the author of several computer books for children, including *Computer Tutor Junior* (Learning Works; Santa Barbara, CA) and *The Programmer's Guide to the Galaxy* (Lothrop, Lee, and Shepard; New York, NY).

CUT OUT AND LAMINATE

7

BASIC TASK CARD

3 INTERMEDIATE

MISSING PARTS

X 6

The program below is supposed to drill you on 10 multiplication problems. However, two of its three subroutines are missing. Fill in the missing subroutines. Then enter and run the program. Use the program to practice your multiplication skills.

```
NEW
10 REM MULTIPLICATION DRILL PROGRAM
20 PRINT "ENTER A NUMBER FROM 2 TO 10."
30 INPUT N
40 IF N<2 OR N>10 THEN PRINT "ENTER ANOTHER NUMBER.":GOTO 20
50 S = 0
60 FOR M = 1 TO 10
70 GOSUB 1000: REM SUBROUTINE THAT DISPLAYS THE PROBLEM AND GETS THE ANSWER FROM THE PLAYER
80 GOSUB 2000: REM SUBROUTINE THAT CALCULATES ANSWER, CHECKS PLAYER'S RESPONSE, AND ADDS 1 TO THE SCORE (S) IF THE ANSWER IS CORRECT
90 NEXT M
100 GOSUB 3000: REM SUBROUTINE THAT DISPLAYS FINAL SCORE
110 END
99 REM DISPLAY PROBLEM
1000 PRINT "WHAT IS  ";N;"x";M;"?"
1010 INPUT X
1020 RETURN
1999 REM CALCULATE AND COMPARE ANSWER
2000 _____
2010 _____
2020 _____
2999 REM FINAL SCORE
3000 _____
3010 _____
```

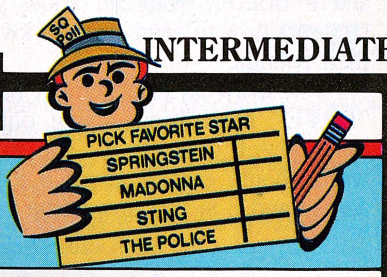
ANSWERS: Check your programs with your teacher.

8

BASIC TASK CARD

INTERMEDIATE

The People's CHOICE



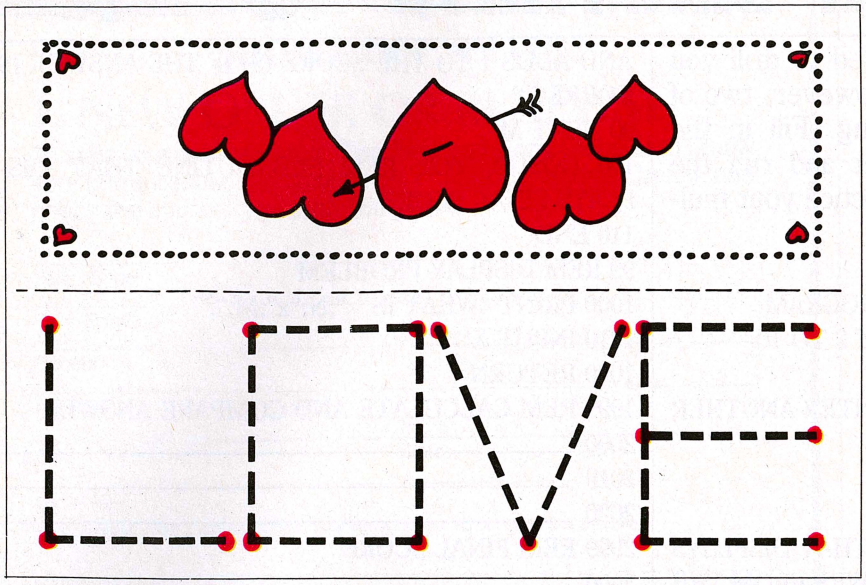
Polls are surveys that help you find out what people think. The program below helps you find out which rock group or star is most popular among your friends. The program has a few bugs in it, however. Find and fix the bugs. Then type in and run the program.

```
NEW
10 REM POLL PROGRAM
20 PRINT "HOW MANY PEOPLE WILL TAKE THE POLL?"
30 INPUT P
40 FOR I = 1 TO P
50 GOSUB 2000:REM GET RESPONSES TO QUESTION
60 NEXT I
70 REM RESULTS
80 PRINT A;" VOTED FOR BRUCE SPRINGSTEEN"
90 PRINT B;" VOTED FOR MADONNA"
100 PRINT C;" VOTED FOR THE POLICE"
110 PRINT D;" VOTED FOR STING"
120 PRINT E;" VOTED FOR NONE OF THESE."
1000 PRINT:PRINT "ENTER THE NUMBER (1-5) OF YOUR FAVORITE ROCK GROUP OR STAR."
1010 PRINT "1. BRUCE SPRINGSTEEN."
1020 PRINT "2. MADONNA."
1030 PRINT "3. THE POLICE."
1040 PRINT "4. STING."
1050 PRINT "5. NONE OF THESE."
1060 INPUT N
1070 IF N<1 OR N>5 THEN PRINT "ENTER A NUMBER FROM 1 TO 5.":GOTO 1060
1080 IF N = 1 THEN A = A + 1
1090 IF N = 2 THEN B = B + 1
1100 IF N = 3 THEN C = C + 1
1110 IF N = 4 THEN D = D + 1
1120 IF N = 5 THEN E = E + 1
```

ANSWERS: Check your program with your teacher.

MICRO IDEAS

QUICK COMPUTER TIPS AND ACTIVITIES



Have students create their own valentines using Logo — but remember that the top design will be upsidedown when the printout is folded!

CREATE A LOGO LOVE NOTE

If you have a Logo program, an Apple or a Commodore computer, and a printer, you can show your students how to send cards of love to their friends.

First, draw an enlargement of the "LOVE" illustration above onto a clean sheet of acetate. The entire word should extend about 8 inches across and 3 inches down (the width and a little less than half the height of your computer screen). The letters should be kept at simple angles (for example, a 90-degree square "O" and 45-degree angle "V").

Use the commands below to guide the cursor to the left side of the screen for your students:

```
TO SETUP
  FULLSCREEN
  PU LT 90 FD 130 LT 90 PD
END
```

Once these commands are stored, you need only type in SETUP and the cursor will return to this starting point (the top of the "L") for you.

Now, place your acetate dot drawing over the computer screen, lining up the top left dot on the acetate with the cursor at its new starting point. Tell students to use the Logo commands PENUP (PU), PENDOWN (PD), FORWARD (FD), BACK (BK), RIGHT (RT), and LEFT (LT) to connect the dots and spell the word "LOVE." Children will still have the top half of the screen on which to make an original design or drawing. Explain to the kids that whatever they decide to draw on the top half of the screen will be seen upside-down once the Valentine's Day cards are printed and folded over.

After students have printed out their love notes, show them how to fold the paper in half so that "LOVE" appears on one side, and their design appears on the other. If they wish, students can color in their design and the word "LOVE." Be sure to have each student add a message inside his or her card.

Phyllis Kalowski
Cambridge, MA

SHOW THE COMMUNITY WHAT YOU CAN DO!

Teachers and students deserve more recognition for their work with computers. One way to get the recognition you deserve is to initiate a public relations campaign in your classroom. Kids will have the opportunity to boast about the educational benefits they reap from computers. And the community will have a chance to see how well their tax dollars are being used. Listed below are some ideas you might try to get the ball rolling:

- Have students write a 20-to 30-second radio "commercial" (45 words or less) about your school's computer program. Thirty seconds may not seem very long to you or the kids, but clock the public information messages already on the radio; they're not much longer than that.

Have a student research the name of the proper person at a local broadcast station to get in touch with, and send your message out about two weeks before the class wants it aired. Maybe the kids will want to put the message on tape and send that to the station instead. It's just possible that they'll be hearing their own voice over the air rather than a d.j.'s!

- After your class masters the short message, challenge them to write news releases (which are longer, provide more information, and are usually sent to print media, rather than broadcast media).
- Displays and exhibits, set up at local businesses and stores, are also popular PR techniques for a class. A local merchant, post office, or bank, is often willing to offer lobby or window space.

Once an agreement is worked out, set your pupils to work to create posters, bulletin board designs, and other artistic displays that suit the setting. For example, a display at your local bank might demonstrate the ways that banks use computers to conduct their business.

- With permission from the school, students might even be able to invite the community to the classroom for a public demonstration that shows off their computer skills. They could demonstrate what a word processor can do. Or, show off the benefits of a data base on dinosaurs.

The kids would, of course, also be responsible for the publicity campaign that would spread the word about this in-school event.

- One more idea: draft a letter to

your mayor requesting a formal proclamation be made for "Computers in our Schools Week," or "Students and Computers Month." You may want to tie the proclamation in with a school event, such as an open house, but that is not necessary. A telephone call or personal letter is often all that is needed to get an official proclamation drafted. Once disseminated, these proclamations can spur a visit from a local newspaper reporter or photographer.

Don't be shy! Let the world know the good work that you do!

Anthony D. Fredericks
Mertztown, PA

SAFE-KEEPING FOR FLOPPY DISKS

Floppy disks are sensitive to even small particles of dust. No matter how clean I keep the work area in my class, I am still nervous that it may not be clean enough. As a precaution, I store any frequently used disk in its own plastic snap-lock sandwich bag (approximately 4 1/4 x 3 3/4 inches). Behind the dustcover in each snap-lock bag, I place a stiff cardboard sheet (approximately 4 x 3 1/2 inches) with a printout of the disk's menu. Now disks will not be damaged by dust, even if accidentally dropped on the floor. And, thanks to the cardboard menus, I can locate specific files and programs faster.

Tony Addicoat
Australia

CELEBRATE BIRTHDAYS — ELECTRONICALLY

If you know that a child in your class has a birthday coming up, find out some facts about someone famous, living or dead (artist, writer, politician, president, actor, etc.), with a birthday on the same day. Ask the student to write a short report about that person on the word processor. Distribute the report to the rest of the class. Also, have the child write and distribute a short autobiography about him or herself, mentioning traits and common experiences (besides birthday) that he or she shares with the famous person (if there are any).

When the class is aware of who both birthday celebrities for the day are, they are ready to sing them a happy birthday wish. This musical program is designed so that your Radio Shack Color Computer can sing along, too!

```
1   REM COCO HAPPY BIRTHDAY
5   PRINT"HAPPY BIRTHDAY"
10  FOR N=1 TO 25
20  READ S,T
30  SOUND S,T
40  NEXT T
50  DATA 89,4,89,4,108,8,89,8
60  DATA 133,8,125,16,89,4,89,4
70  DATA 108,8,89,8,147,8,133,16
80  DATA 89,4,89,4,176,8,159,8
90  DATA 133,8,125,8,108,8
100 DATA 165,4,165,4,159,8,133,8
110 DATA 147,8,133,8
```

Line 10 tells the computer to find the 25 necessary notes and play them. In line 20, S stands for the sound number on the Color Computer, and T is for the time you want it to play. Line 30 tells the computer to play that sound for that amount of time.

Micro Idea by teachers at
Waterford-Halfmoon School,
Waterford, NY
Program by Craig Dickinson
Orono, ME

MONITORS THAT YOU CAN WRITE ON

For teachers who have always used chalkboards and paper to explain ideas and concepts, a computer screen can be a frustrating deterrent to a lesson. When I come across a student having a hard time on, say, a math problem, my first impulse is to reach for a pen and draw a diagram right on his or her monitor. But I can't do that, can I?

(continued)

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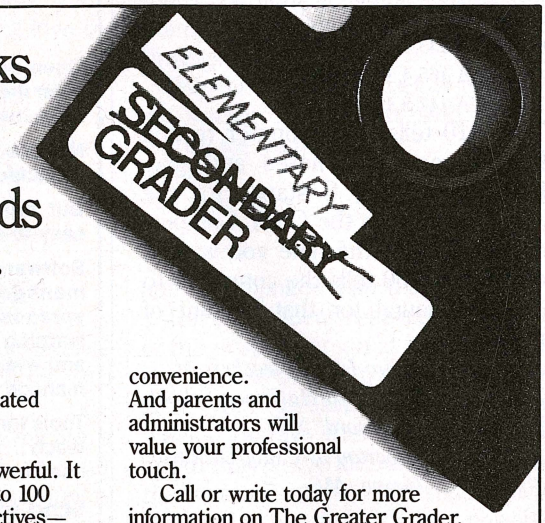

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MICRO IDEAS

(continued from page 51)

Yes I can! I have found that when I write on a monitor with a regular grease pencil, any marks I make wipe right off with a dry tissue. I make it a point, of course, to explain to students that these are the only written marks allowed directly on the screen, and so far I have had no problems from vandals or abusers.

Being able to write on the screen has the added effect of making the computer more friendly to users (kids and teachers alike).

Robert Eicholtz
Houston, TX

Editor's Note: *We checked this idea with technicians at Apple Computer Inc. and they say it's fine as long as the screen is kept dry; never try to wipe grease pencil marks off a monitor with a wet paper towel or tissue.*

CONDUCT A SOFTWARE PREVIEW PARTY

Do teachers in your school find it hard to set time aside to preview new software? At our school this problem was solved by staging a "disks and donuts" party. We wrote to software companies and asked to borrow software titles on a 30-day preview basis. Then, when we had a date set, we reserved the computer room, decorated it colorfully, and brought out the coffee and donuts.

Everyone involved was sent an invitation in the shape of a floppy disk. For us, a disk and donut party was a fun way to get input from the entire staff before software was bought.

Peggy Hare
Meriden, KS

SEND US YOUR MICRO IDEAS

Do you have computer activities, bulletin board ideas, or management tips you'd like to share? Send them to Micro Ideas, *Teaching and Computers,* 730 Broadway, New York, NY 10003. We'll pay $15 to $30 for each micro idea we publish.

The "Safe Keeping for Floppy Disks" idea was reprinted courtesy of *Classroom Computing,* Ashton Scholastic, Australia. ■

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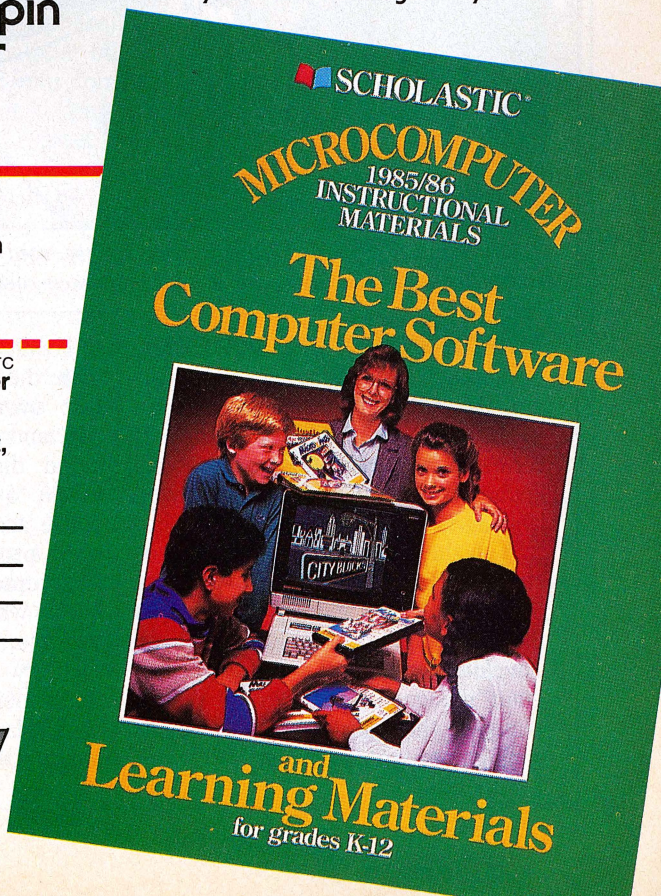

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The kit comes complete with filmstrip, cassette tape, and an introductory floppy disk usable on an Apple II Plus, IIe, or IIc. Each element of the set takes a slightly different yet complementary approach as it introduces components of the microcomputer to students.

The bulk of the package is a loose-leaf notebook that is more than an inch thick. Inside are suggestions on what each grade should know about computers, tips (for both you and students) on how to set up a computer club, ideas for your classroom bulletin board, and, perhaps most helpful, more than 65 reproducible worksheets. The worksheets provide students with activities on everything from building computer vocabulary to identifying uses of computers in society, to constructing flowcharts for writing BASIC programs.

Price: *$145 for complete courseware with backup disk, $40 for separate diskette and backup copy.*

Contact: *Ruth Sather and Associates, Elementary Computer Literacy, 2120 Moonlight Bay Dr., Altoona, WI 54720; 715/835-5020 or 612/221-0214.*

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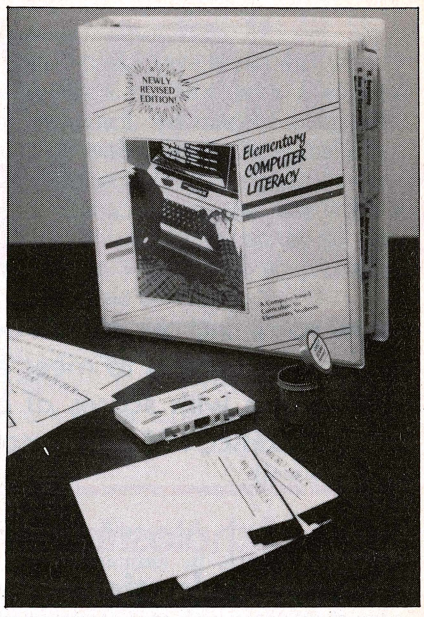

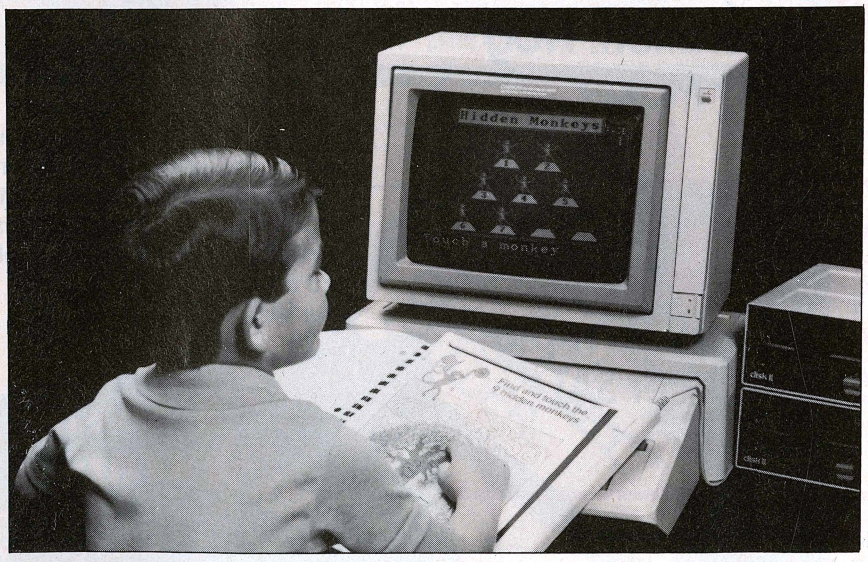

Touch Window's touch-sensitive screen can be used in hand (with or without the interactive book shown here), or mounted over your computer's video monitor.

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Connect Touch Window, a tansparent, flat, pressure-sensitive surface, to the video monitor of any Apple II series computer, and suddenly no keyboard functions or programming languages are necessary.

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Touch Window comes complete with the replaceable, scratch-resistant overlay, hookup cable, stylus pen, and mounting strips; plus a two-sided diskette containing *Touchwriter*, a graphics program, an expense account manager, two games, and a program that corresponds with an interactive book. The interactive book, which is also included in the package, contains activities for elementary school children on telling time, identifying countries, matching flags, planning a route on a map, and more. Other software is available.

Price: *$199.95 for Apple IIc and IIe; $208.95 for Apple II and II Plus (includes adapter cable). Both come with a one-year warranty.* Contact: *Personal Touch Corp., 4320 Stevens Creek Blvd., San Jose, CA 95129; 408/246-8822.*

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PRECOMPUTERS

V-Tech's line of precomputers offers children age 4 to 8 the look and feel of a computer for a fraction of a full-size computer's cost.

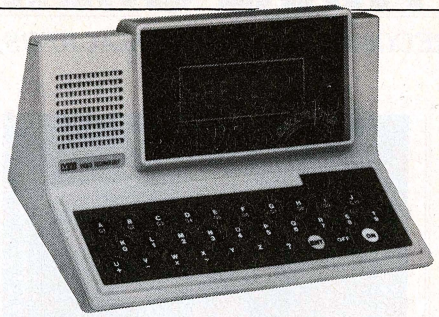
Whiz Kid, the newest precomputer, actually resembles a mini-computer (about notebook size), and makes use of graphics and electronic sound effects. Children insert software study cards to call up exercises on topics such as math, spelling, music, and logic.

The Lesson One mini-computer is

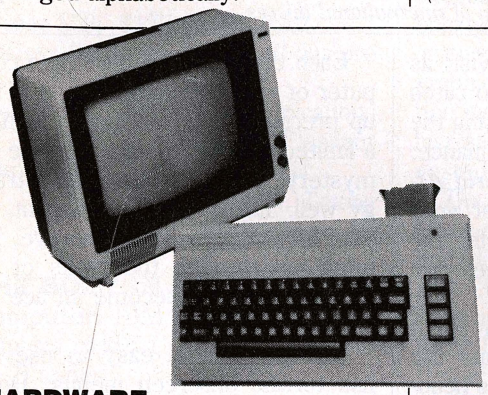
TOOLS OF THE TRADE

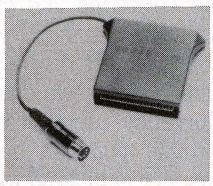
similar to Whiz Kid, but has built-in study programs rather than software cards, and does not have the graphics that Whiz Kid has. Questions appear in bright red lights on a one-line display screen. Correct answers are rewarded with happy musical notes; incorrect answers with an unrewarding "blooper" sound.

On both toys, youngsters enter their responses using touch-sensitive keyboards on which the letters are arranged alphabetically.



Price: *$49 for Whiz Kid; $39 for Lesson One.* Contact: *V-Tech U.S.A., 2633 Greenleaf Ave., Elk Grove Village, IL 60007; 312/640-1776. (Circle 2 on Reader Service Card.)*





HARDWARE THAT TALKS

The age of the talking computer is here, and it's not nearly as expensive as you might think. The Voice Messenger, Easy Speech, and Hearsay are three new products that can help your Commodore 64 or 128 (or Apple II series computer in the case of the third product) to speak.

The Voice Messenger is a speech synthesis module that plugs into the rear of a Commodore 64 or 128 and converts your keyboard into a talking typewriter. If a child presses the letter "A," The Voice Messenger will make the computer say "A," at the same time that the letter appears on the screen. If you spell out the word "the," the computer will say each letter as you type it, and then pronounce the entire word once it is spelled out.

Easy Speech is a software program compatible with the Voice Messenger. Used together, the system allows most preexisting text-driven software to talk. Boot up a program like *ZORK* or the CBS educational series *Success With Math*, for example, and the program will be read to your students. (One drawback, however, is that games such as *ZORK* are slowed down with the use of the speech synthesizer.)

The newest related product in this line of talking terminals is Hearsay, a speech synthesis/voice recognition microprocessor-based peripheral. That may sound like a mouthful, but what it amounts to is that your computer can not only talk, but it can be trained to recognize and respond to your voice. It can take orders from as far away as 10 to 12 feet, with recognition accuracy greater than 95 percent. Hearsay can be used with a Commodore 64, 128, or any Apple II series computer. In addition, educational software is available for Hearsay in which the voice that responds to the child sounds "human." This makes correct pronunciation easier to teach.

Price: *$59.95 for The Voice Messenger; $24.95 for Easy Speech; $99 for Hearsay compatible with the Commodore 64 or 128/ $149 includes application card to allow the system to be used with an Apple II series computer.* Contact: *Welwyn Currah, 104 West Fourth St., Suite 208-9, Royal Oak MI 48067; 313/547-8300. (Circle 4 on Reader Service Card.)* ■

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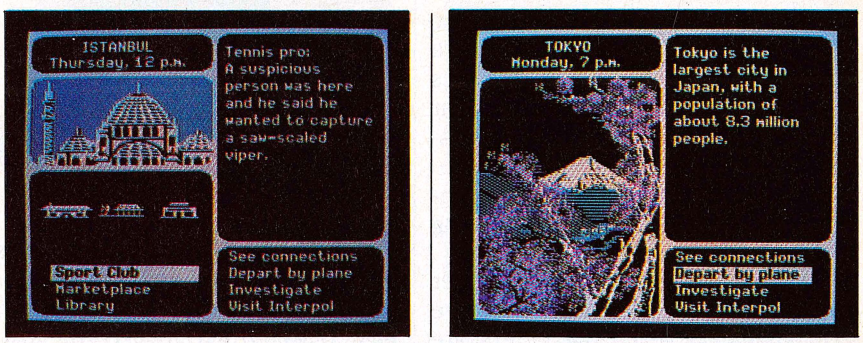
SOFTWARE SHOWCASE

SOFTWARE RECOMMENDED FOR TEACHERS, BY TEACHERS

WHERE IN THE WORLD IS CARMEN SANDIEGO?

Computer: Apple II series
Topic: Social studies
Grade Level: 3–8



As the detective in Where in the World is Carmen Sandiego? *you must "travel" to exotic places all over the world in pursuit of international thieves.*

You are a rookie detective from the Acme Detective Agency. Your mission is to track down a criminal who is a member of the elusive Carmen Sandiego gang. As you travel among 30 capital cities around the world to investigate, you unearth a body of clues that point to the hideout and identity of the thief.

That's the gameplan of *Where in the World is Carmen Sandiego?,* a mystery/adventure program that teaches world geography, trivia, and reference skills. To solve the mystery, you must use a world map and *The World Almanac & Book of Facts.* Both are included with the software.

At the beginning of the game, you are told the sex of the suspect, the treasure that was stolen, and the city where the crime took place. That city is the starting point of the investigation.

From each city, three destinations (capital cities) can be reached by connecting flights. You can call up an onscreen list of these cities.

Each city also has three locations (including banks, palaces, and libraries) that you can visit to get clues about the suspect's identity and destination. For example, a bank teller may tell you that the person you are looking for changed all her currency to rupees.

The World Almanac helps unravel clues by providing information about the countries and cities you visit as well as other facts you need to catch your suspect. For example, using the bank teller's clue and the "Finance: Currency" section of *The World Almanac,* you can discover that your suspect is headed for New Delhi, the capital of India, where rupees are used.

As you gather information about the thief, you can enter it into the crime computer at the agency's headquarters to narrow down your suspects. The crime computer provides a list of suspects who have the characteristics you enter. For example, if the thief is a female who plays tennis, she could be Dazzle Annie Nonker, owner of the toughest yogurt bar east of Suez, or Carmen Sandiego, secret agent for so many countries that even she doesn't know who she's working for.

Once you narrow your list to one suspect, the crime computer issues an arrest warrant. If you don't have a warrant when you catch up with the thief, he or she can escape.

Each time you use the crime computer or visit a clue location, you use up precious time. Because you have a limited amount of time to solve the mystery, you must plan your strategy well. Every case is different. As your investigative skills improve, you move up through the ranks of the agency until you become an ace detective.

The program is easy to use and has terrific onscreen menus. Documentation includes game directions, hints for being a good sleuth, and police dossiers that contain helpful clues about the suspects.

Where in the World is Carmen Sandiego effectively combines elements of trivia, adventure, and arcade-style games in a motivating program that develops social studies skills. Students will use it over and over.

Price: $39.95
Policy: No backup; no preview
Source: Broderbund, 17 Paul Drive, San Rafael, CA 94903; 415/479-1170

Philip Ingber, Computer Coordinator
Nyack Public Schools, Nyack, NY

TARGETS

Computer: TRS-80 Models III, 4; Atari (48K); Apple II series
Topic: Math
Grade Level: 2–6

Targets is a math game that uses whole numbers to develop problem solving skills. The object is to use only set numbers (one or a combination of the set numbers) to reach a target number, or to discover that reaching the target with the set numbers is impossible.

Suppose the set numbers are 4 and 2 and the target is 20. One possible solution is to use the numeral 4 five times: 4+4+4+4+4. This solution requires five steps. Another solution, 2+2+2+2+2+2+2+2+2+2, requires 10 steps. Either solution is correct, but students are encouraged to reach their target using the smallest number of steps.

There are three levels of play. In the first level, students use addition only to reach the target. In the second level, they can use addition and subtraction. All other operations are allowed in the third level. Also, the third level introduces parentheses to the equations. For example, (6+3)x3 is one way to reach 27.

At each level, students have the option of choosing either the set numbers (1 – 9) or the target number (0 – 99) of a problem. If students choose the set numbers, the computer randomly selects the target number. If they choose the target, the computer selects the set numbers.

Once students have succeeded at any level, they can play a championship game. In this game, students try to reach the target number by using a smaller number of steps than the cur-

rent champion. If they succeed, their name, equation, and solution are stored for others to challenge.

The program is easy to use. Documentation is adequate, but lacks imaginative supplementary activities.

Targets is not designed to teach new concepts, but rather to provide an environment where children can experiment with combinations of numbers. It is a valuable problem solving activity that promotes thinking.

Price: $59; $177 for lab pack
Policy: Backup included; 30-day preview
Source: Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; 800/431-1934

Craig Dickinson, Teacher
Asa C. Adams, Orono, ME

THE BODY IN FOCUS

Computer: IBM PC, PCjr (requires graphics card); Commodore 64; Apple II series
Topic: Science
Grade Level: 5–11

Hey science teachers, what if you could peel away a layer of the body to reveal what's underneath? That's exactly what *The Body in Focus* lets you do on the computer screen. Using high resolution animated graphics, the program demonstrates how body systems work and allows students to peel away layers of the head, torso, and arm to reveal underlying structures.

The program's structure allows students to easily explore body parts at their own pace. Its two disks are divided into three interactive segments. The first, Body Systems, explains and graphically depicts the eight major body systems. Students can observe how the body breathes, digests food, pumps blood, moves muscles, and sneezes.

Body Close-Ups, the second section, allows students to peel away layers of the head, torso, and arm so they can inspect organs in detail.

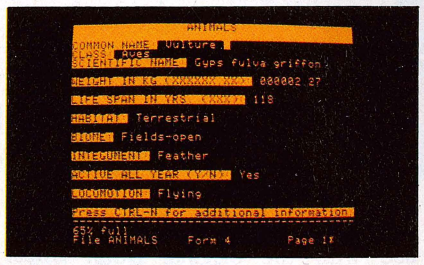
The last section, Body I.Q., is a review session that contains up to 200 random checkup questions. Some questions require students to move the cursor to designated body parts. Others have multiple choice answers. For example, one question asks students to identify another name for the voice box from these choices: pharynx, esophagus, and larynx *(larynx is the answer)*. The quiz varies the organization of the questions and the arrangement of multiple choice answers, but doesn't allow students to choose the body part they want to review.

An attractive keyboard overlay simplifies keyboard commands and enhances all the activities. The program's best features are its excellent graphics and animation. Documentation includes directions, anatomical illustrations, and a bibliography of suggested biology resources.

The Body in Focus is a splendid blend of accurate anatomical text and graphics. Perfect for curious students and classroom presentations, the program is a must-buy for any biology or health class.

Price: $55.95; $167.85 for lab pack of 10
Policy: Backup included; 30-day preview
Source: CBS Software, One Fawcett Place, Greenwich, CT 06836; 800/ASK-CBS4

Larry Pogue, Computer Coordinator
Huber Heights City Schools
Huber Heights, OH



Sample data base on vultures.

SCHOLASTIC LIFE SCIENCE DATA BASES FOR SCHOLASTIC PFS: FILE

Computer: Apple II series (printer required)
Topic: Science
Grade Level: 6–12

This package contains five curriculum activity units that use a data base management program called *Scholastic pfs: File* to teach science skills. Three of the units use data files that come with the package: BIRD MIGRATION, ANIMALS, and ANIMAL BIOLOGICAL SYSTEMS. Two others help students to build their own files: WILD FLOWERS and DRUGS.

The "Using Files" section contains previously researched and recorded data on bird migration, animals, and biological systems, presented on three sets of two disks. For example, the MIGRATE file includes data on more than 230 birds, their migratory status, arrival and departure dates, habitats, and major food sources. The ANIMALS file includes a variety of data on more than 130 different animals. The SYSTEMS file includes more than 90 animals with a description of 10 different biological systems for each, including the skeletal, nervous, circulatory, sensory, and endocrine systems.

The "Creating Files" units teach students to build their own files on WILD FLOWERS and DRUGS by using file designs provided in the documentation. Children collect their own data and use their own disks to store it.

The excellent documentation for this package is presented in a loose leaf binder that organizes material into these segments: Teaching Guide, Using Files, Creating Files, Quick Guide, File and Report Mini-References, Glossary, and Appendices.

Scholastic Life Science Data Bases for Scholastic pfs: File presents a variety of activities that allow teachers to individualize instruction. The program's off-line activity suggestions are outstanding. In a few cases, however, activities required *Scholastic pfs: Report* (a program sold separately from *Scholastic pfs: File*) and this was not made very clear to me.

Price: $99.95
Policy: Backup included; 30-day preview
Source: Scholastic Software, 730 Broadway, New York, NY 10003; 800/325-6149. In Missouri call 800/392-2179

R.Anthony Baraloto
Instructional Resource Department
Montgomery County Schools
Rockville, MD

(continued)

Circle 25 on Reader Service Card.

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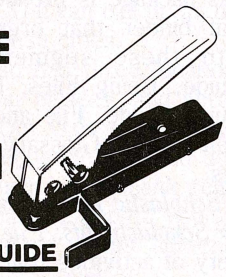

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SOFTWARE SHOWCASE

(continued from page 57)

ACTIVITY FILES FOR THE BANK STREET WRITER: Writing Activities and Language Skill Builders

Computer: Apple II series; Commodore 64; IBM PC, PCjr; Atari (48K)
Topic: Language arts
Grade Level: 6–8

Activity Files for the Bank Street Writer: Writing Activities and Language Skill Builders is a tantalizing assortment of writing activities for children to use with the *Bank Street Writer* word processing program.

The program contains 35 files to be used in 22 different writing activities. The activities require students to use the advanced features of the word processor to develop their writing skills.

The program focuses on writing as a process, rather than as a product. For example, the fantasy files (FANTASY, FAN1, and FAN2) set up situations for students to imagine such as "I'm standing in a field, and all around me I see . . ." The text then coaches students to fill in the details of the guided adventure by writing without attention to grammar, spelling, or punctuation.

The documentation includes a general introduction, a summary of the files, and a resource list. For each file, it also contains objectives, text, and classroom use suggestions. Unfortunately, it doesn't provide adequate guidance for teachers who are new to process writing. For those teachers, it may be helpful to read one or more of the works cited on the resource list.

Because the files are designed for use with the original *Bank Street Writer,* some text files contain instructions that will not work with the new 128K version of *Bank Street Writer.*

Price: $59.95
Policy: Backup included; 30-day preview
Source: Scholastic Software, 730 Broadway, New York, NY 10003; 800/325-6149. In Missouri call 800/392-2179

Gwen Solomon, Computer Coordinator
Stevenson High School, Bronx, NY

TALKING TEACHER

Computer: Commodore 64
Topic: Language arts
Grade Level: K–2

A program that talks without special hardware? That's the advantage of *Talking Teacher,* an innovative program that uses speech synthesis on a disk, excellent graphics, and sound to teach letters and words to young children.

The program has three levels of play. In lesson one, the child presses any key and the computer pronounces the letter it represents. Then, an onscreen, animated hand draws the letter in uppercase and lowercase. As new letters appear, the old letters move down to the bottom of the screen. Advanced children can have their names and other messages presented this way by typing letters in the correct sequence.

Lesson two pronounces and displays the letters of the alphabet in sequence. After each letter appears on the screen, the computer asks the child to find it on the keyboard and press it. Once it is pressed, the animated letter "joins" a series of letters to form a word. For example, the letter "d" moves over and joins "-olphin" to form the word "dolphin." Graphics illustrate each word on the screen. If the child presses a wrong key, the computer provides helpful hints, such as "Try a little lower."

The third lesson is a review. The computer randomly selects words and asks the child to press the letter on the keyboard that begins that word. For example, it might say, "What letter does *rooster* start with?" Correct answers are rewarded with music. Mistakes are corrected and repeated later in the lesson.

Talking Teacher is one of the most imaginative programs of the year. Speech synthesis, excellent graphics, animation, and sound make it an excellent teaching tool.

Price: $34.95
Policy: No backup; no preview
Source: Imagic, PO Box 1027, Menlo Park, CA 94026; 415/366-1042

Philip Ingber, Computer Coordinator
Nyack Public Schools, Nyack, NY ■

Circle 26 on Reader Service Card.

(continued from page 23)

CUT OUT AND LAMINATE

TASK CARD 6
A Change of Plans

Complete Task Card 5 before you try this card.

After some thought, Doris and Wilbur decided that they didn't want to wait until Halloween to marry. It was too far off for them. They agreed that Valentine's Day would be a more appropriate holiday for a marriage, anyway. They decided to change some of the other wedding plans, too.

1. Call up your invitation file.
2. Change the invitation to show that the date is now February 14, 1986.
3. Change the note about the reception to read that guests should bring their own chocolates.
4. Add a personal note at the bottom of the invitation to Horace or Chloris.
5. Make a printout of the file. Save the file in case you need it later.

TASK CARD 7
Saying No Gracefully

Complete Task Card 6 before you try this card.

"Attend Doris' wedding? Are you kidding? I never really cared for Doris. She was a very bossy big sister!"

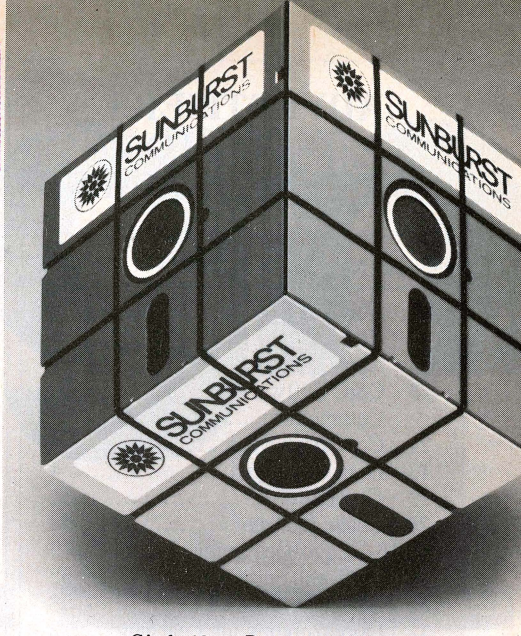
1. Pretend that you are Horace. Write a letter to Doris to inform her that you will not attend the wedding in Transylvania.
2. In your letter, tell Doris about all the beautiful things she turned down when she didn't show up at the mansion, including the walrus tusks and the necklace.
3. Make a printout of your letter. Then save it under a special file name.

TASK CARD 8
"I Do" & "I Will"

Complete Task Card 7 before you try this card.

Chloris and Doris usually got along as children.

1. Pretend that you are Chloris. Write a letter to Doris to inform her that you *do* plan to attend the wedding. Be sure to tell her your airplane flight number, as well as the day and time of your arrival in Transylvania.
2. While you're at it, a few questions about Wilbur are in order. Also, how about his family? Will they be attending? Are Waldo and the cats going to be there, too? Ask Doris for some more details about the big event.
3. Print out your letter. Save the file.



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CONVERSION CHART

HOW TO CONVERT T & C *PROGRAMS TO OTHER MACHINES*

The *Dental Check-Up* program (page 42) is written for the Apple II series of computers. Use this conversion chart to adapt the program listing for use on Atari, Color Computer, Commodore 64, and TRS-80 computers. For more information on how to use specific commands, refer to your user's manual.

PROGRAM OF THE MONTH: *DENTAL CHECK-UP*, page 42 (Apple)

Atari Series

1. Substitute the following lines for corresponding lines in the Apple program listing.

```
20 PRINT CHR$(125):CLR:DIM N$(40),Z$(1),C$(2)
860 GRAPHICS 3:SETCOLOR 4,12,4:FOR D = 1 TO 1000:NEXT D:GRAPHICS 0:PRINT CHR$(125)
1440 SOUND 3,100,6,8:FOR D = 1 TO 100:NEXT D:SOUND 3,0,0,0
```

2. Change HOME to PRINT CHR$(125) in lines 200, 1350, 1490, and 10040.
3. Do not put spaces between greater than, less than, and equal signs. For example: 960 IF C$<>"1" THEN SC=SC+1

Commodore 64

1. Substitute the following lines for corresponding lines in the Apple program listing.

```
20 PRINT CHR$(147):CLR
860 POKE 53281,0:FOR D = 1 TO 1000:NEXT D:POKE 53281,7:PRINT CHR$(147)
1440 POKE 54296,8:POKE 54273,47:POKE 54272,107:POKE 54276,33:FOR D = 1 TO 100:NEXT D:POKE 54276,0
```

2. Change HOME to PRINT CHR$(147) in lines 200, 1350, 1490, and 10040.

TRS-80 Series

1. Change line 20 to: 20 CLS:CLEAR 1000
2. Change HOME to CLS in lines 200, 1350, 1490, and 10040.
3. Change "PRESS RETURN" to "PRESS ENTER" in lines 90, 190, 850, 1330, 1480, 1670, and 10020.
4. Delete lines 860 and 1440.

Color Computer

1. Follow steps 1 through 3 of the TRS-80 conversions.
2. Substitute the following lines for corresponding lines in the Apple program listing.

```
860 SCREEN 1,1:FOR D = 1 TO 1000:NEXT D:CLS
1440 PLAY "A"
```

ANSWERS TO "MICRO TIMES"

Space Probes

Following are answers to the review questions.

1. About every 76 years; **2.** Telescopes; **3.** They will photograph the comet, measure it, and study its gas and dust particles; **4.** Giotto will take eight months, Vega 1 and Vega 2 will each take 15 months, and Planet-A will take seven months; **5.** Giotto; **6.** Vega 1; **7.** The effects of the sun on the comet. **8.** Accept any reasonable responses.

Make a City Block

The following procedure (for Apple Logo) draws the World Trade Center, buildings of different sizes, and row houses. Students' procedures will vary.

```
TO BLOCK
  PU SETPOS [-130 120] PD
  BASE 190 30 PU RT 90 FD 40 LT 90 PD
  BASE 190 30 RT 90 FD 30 LT 90 BK 110
  BASE 80 50 RT 90 FD 50 LT 90 FD 70
  BASE 150 25 RT 90 FD 25 LT 90 BK 50
  BASE 100 35 RT 90 FD 35 LT 90 BK 80
  REPEAT 4 [BASE 20 20 ROOF 20]
END
```

Be a Computer Banker

Mr. Rich: 147 - 40 = 107; Miss Munny: 266 - 70 = 196; Mr. Penni: 62.54 - 25.00 = 37.54; Mrs. Greenback: 210 + 171 = 381; Ms. Dollare: 152.13 + 92.47 = 244.60.

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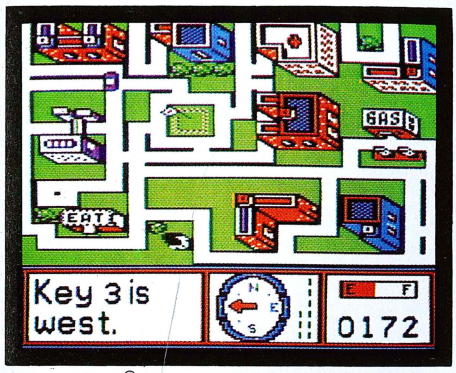
Map Skills for Ages 6 to 9



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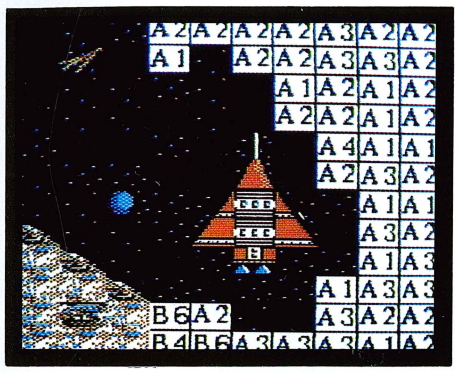
Available for use with Apple and Commodore 64 personal computers.

PICTURES

Design Skills for Ages 8 to Adult

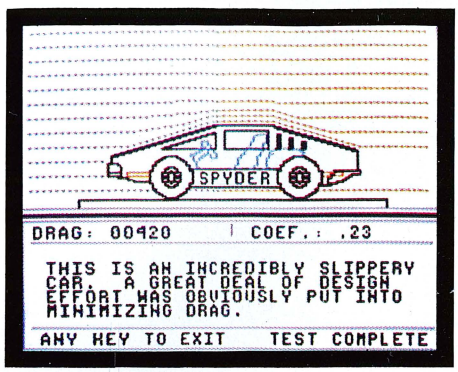


Pic.Builder™
Construct color pictures block by block — from castles in air to satellites in space! Use 40 build-by-number pictures stored on the disk to build up design skills…then go on to invent your own pictures! Endless possibilities, so the program never grows stale. Save pictures and print them…or use **Pic.Builder** with other graphic utilities to create outstanding designs!

Available for use with Apple®, Atari®, and Commodore 64® personal computers.

CARS

Engineering Skills for Ages 8 to Adult



Car Builder™
Design, construct, refine and test cars that you build! Get firsthand experience as you design chassis, engine, suspension system — all the mechanics of car building. Use the wind tunnel and test track to test the aerodynamic, racing, and fuel capabilities of your car. No limit to the number of cars you can design and store to disk.

Available for use with Apple personal computers.

Weekly Reader Family Software

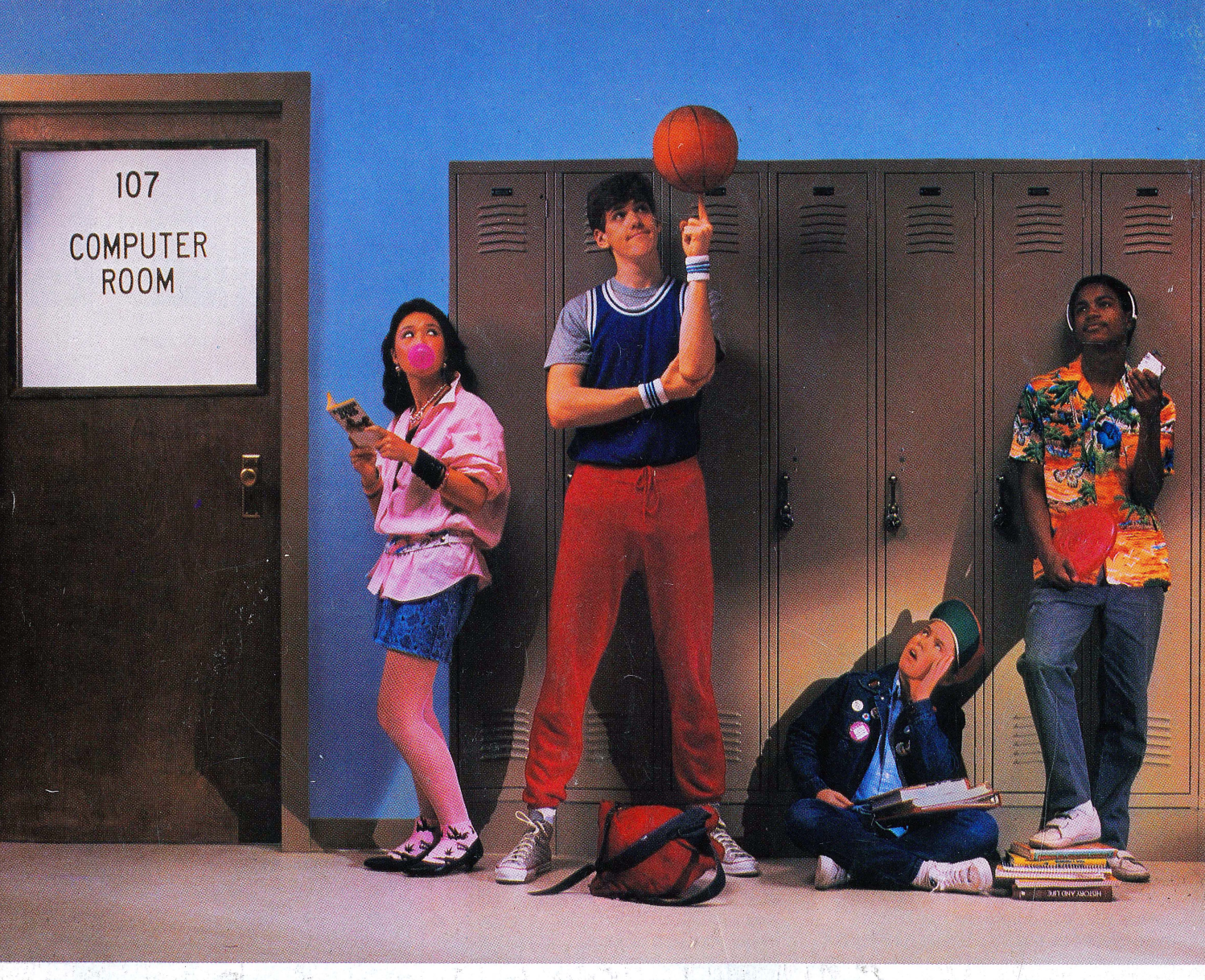
Middletown, CT 06457

Software programs developed by Optimum Resource, Inc. Apple, Atari, and Commodore 64 are registered trademarks of Apple, Inc., Atari, Inc., and Commodore Electronics, Ltd., respectively.

A/MS50-3

& Build

Circle 29 on Reader Service Card.



With Commodores instead of Apples these kids would be on computers instead of in line.

The Commodore 128™ and Commodore 64® personal computers are already at the head of their class.

And putting more students on computers for less money is just the beginning.

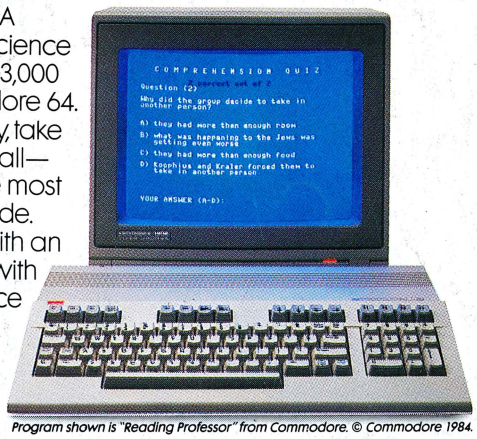
The Commodore 128 not only outsmarts the Apple® IIc in price, it comes out way ahead in performance. With unmatched color graphics and music capabilities.

And the Commodore 128 has features the Apple IIc couldn't give you at any price: An expandable memory by 512K which gives students the versatility to learn more advanced applications. More commands for easier programming. A numeric keypad (a must in math or science classes). And compatibility with over 3,000 programs designed for the Commodore 64.

If your needs are more elementary, take a look at the computer that started it all—the lower-priced Commodore 64, the most popular personal computer ever made.

And your Commodore comes with an exclusive school service agreement with RCA and over 600 independent service companies.

For more intelligence at a price that makes sense, size up the Commodore 128 and 64. They can sure lower the cost of a higher education.



Program shown is "Reading Professor" from Commodore. © Commodore 1984.

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COMMODORE 128 AND 64 PERSONAL COMPUTERS

A Higher Intelligence